DOCUMENT RESUME

ED 237 528 TM 830 774

AUTHOR	Cunningham, Sandra; And Others
TITLE	IER Criterion-Referenced Mathematics Objective and Item Bank: A Bank of Mathematics Objectives and Test Items for Grades One through Eight.
INSTITUTION	Institute for Educational Research, Glen Ellyn, IL. IER Test Development and Service Center.
PUB DATE	79
NOTE	206p.; For related documents, see TM 830 775-776.
AVAILABLE FROM	Institute for Educational Research, 793 N. Main St., Glen Ellyn, IL 60137 ($95.00).
PUB TYPE	Tests/Evaluation Instruments (160)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Arithmetic; Charts; *Criterion Referenced Tests; Decimal Fractions; Educational Objectives; Elementary Education; *Elementary School Mathematics; Geometry; Graphs; Integers; *Item Banks; Latent Trait Theory; Mathematics Achievement; *Multiple Choice Tests; Numbers; Problem Solving; *Quantitative Tests; Test Construction; Test Items
IDENTIFIERS	Rasch Model

ABSTRACT

The mathematics objective-item bank contains 100 objectives each represented by five to eight multiple choice items. Grade levels covered are one through eight. The objectives deal with such topics as decimals, fractions, geometry, graphs and charts, integers, numeration, problem solving, and whole number operations. The items have been field tested on students in 32 school districts and have been calibrated according to the Rasch logistic model. The bank can serve as a starting point for developing tests of mathematics achievement tailored to the local district curriculum. Such tests can be used for district program evaluation, student diagnosis, competency testing, and formative or mastery testing. (Author)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED237528

IER CRITERION-REFERENCED MATHEMATICS OBJECTIVE AND ITEM BANK

I.E.R.

a bank of mathematics objectives and test items for grades one through eight

Dr. Sandra Cunningham
Dr. Michael J. Gartland
Dr. Diann Musial

TM830774

IER Test Development & Service Center
Institute for Educational Research
793 North Main Street
Glen Ellyn, Illinois 60137

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

S. Cunningham

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

- Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

Copyright © 1979 by Institute for Educational Research

Introduction

Background. The Institute for Educational Research Criterion-Referenced Objective and Item Banks evolved from a desire on the part of numerous school districts to have a pool of test items readily available for use in a variety of ways. Some districts were concerned with generating criterion-referenced tests for use in program evaluation, to either replace or, more often, supplement existing norm-referenced testing programs. Others sought a pool of items that could be used on a day-to-day basis by classroom teachers in assessing the progress of individual students through instructional units and as an aid in planning future instruction. Still others sought a pool from which to develop competency tests.

Staff members at the Institute for Educational Research (IER) formulated a plan by which area school districts could assist in developing a common pool of objectives and test items to meet their needs. Two pools were to be developed, one in mathematics and the other in language arts, covering grades one through eight. The project contained five major phases: (1) the selection of a basic core of instructional objectives by representatives from 23 area school districts; (2) the formulation of a network of overlapping test forms containing eight items per objective; (3) field-testing of the test items by participating districts; (4) Rasch analysis of the items; and (5) the final formulation of calibrated item pools.

Selection and Targeting of Objectives. The process of selecting objectives began by first accumulating objectives and their corresponding item pools. Objectives were accompanied by test items written to have a high degree of content and difficulty homogeneity within objective. The items were purposefully written in this manner to facilitate random selection of items from a pool to assess the level of proficiency in the skill or concept defined by the objective. The degree to which such homogeneity had been achieved was one outcome of the statistical analysis.

Work sessions were scheduled to select the objectives whose items would be calibrated in the project. Each participating district was asked to supply at least one experienced "master teacher" at each grade level to select objectives. The task of these individuals was two-fold: (1) to select the most important, most crucial objectives to be mastered at their grade level, and (2) in doing so to target the items for students of the appropriate ability level. This latter element was important to the success of the Rasch analysis; items too difficult or too easy provided little information and were eliminated from the analysis. The teachers selecting objectives were asked to use experience and professional judgment as the major criteria in making their decisions. The content validity of the item pool rests upon this judgment.

The 15 objectives receiving the highest ratings at each grade level were chosen to be included in the project. In most cases, eight items per objective were randomly selected from a larger pool of items for field-testing. A computer program (FORMS) was used to generate 45 overlapping test forms. Each form contained approximately 40 items. In order to establish the network of linking items necessary to calibrate all item difficulties on a single scale, items appeared on two different forms. The interlocking links spanned from one to five test forms.

Field Testing. Forty-five test forms, containing nearly 1800 items (900 unique items), were formulated and field-tested in the participating districts. The ten forms for grades one and two used verbal directions and consumable test booklets. Intermediate and upper grade students answered directly on OPSCAN data sheets. Each district was assigned one test form at each grade level. Each form was administered in five districts resulting in a total sample size of approximately 4300 students.

Item Analysis. Since the pool consisted of criterion-referenced items, a latent trait model was appropriate for item analyses. Latent trait theory, sometimes referred to as "item response theory" or "item characteristic curve theory," attempts to measure some unobservable trait or ability that accounts for performance on a test. Of the various models that have been proposed, the Rasch or single-parameter logistic model was chosen. A latent trait model, and in particular the Rasch Model, is especially appropriate for this type of analysis for several reasons. First, the joint nature of the project meant that test items would be administered to students of differing abilities in many, quite different, communities. Traditional measures of item difficulty are a function of the ability of individuals responding to the items. Latent trait models, on the other hand, are "sample-free"; item difficulties are adjusted for the influence of sample ability levels and variance, and are therefore independent of any one sample or community. Second, latent trait models overcome difficulties in attempting to link together items that vary greatly in difficulty. Since item parameters are "ability-free," it is possible to assign item difficulties based on a single continuous scale covering the entire range of abilities from grades one through eight. This feature is especially desirable in monitoring the progression of individual students through a continuous instructional sequence. The Rasch Model, in particular, was selected because of the theoretical assumptions and practical considerations required for its application. A computer program (FORCAL) was first used to obtain a Rasch calibration of items within forms. The selection of valid items through the Rasch Model required the evaluation of several fit statistics.

Rasch analysis calculates the expected probability of success when an individual attempts to answer a given item. The expected probability is based on estimates of the individual's ability (determined by the individual's responses across items) and the item's difficulty (determined by responses to the item across individuals). This probability is given by the equation

$$Pvi = \frac{e^{(\beta v - \delta i)}}{1 + e^{(\beta v - \delta i)}}$$

where βv is the ability of individual v and δi is the difficulty of item i.

Estimates are compared with the observed values. The squared residuals are then summed over items to form an approximate chi-square distribution for testing the fit of the item. In practice, several fit statistics, along with difficulty and discrimination indeces, were evaluated from each item. Items which were found to not be "working properly" were removed from the pool and were examined closely in an effort to identify the cause. Mis-fitting may be caused by ambiguous or confusing wording, mis-targeting of items (items too easy or too hard for the ability of the sample), poor or misleading distractors, items which do not measure the same latent trait (variable) measured by the rest of the items, or interactions between an item and individuals which are idiosyncratic to a certain subgroup.

The next stage of analysis used a computer program (SHIFT) to link the various forms together. SHIFT compared the difference in difficulty values for each pair of linking items and subsequently calculated a mean shift in difficulty from one form to another. Once the difficulty level of items within forms and the relative difficulty of each form was known, the difficulty of each item on a single continuous scale was determined by an additive process. The final result, referred to as an item map, is a calibration of all items on a single scale of difficulty, representing a single underlying trait of mathematics.

The analysis of Rasch fit statistics supplants the traditional reliability and discrimination indeces. Similar measures were calculated and evaluated for each item, but lose their meaning when items are taken out of a specific test form and placed in an item bank. It is sufficient to know that all items surviving the Rasch analysis are reliable in their ability to consistently measure person abilities and discriminate positively.

Results of the Rasch Analysis. The Rasch analysis of the mathematics item pool produced the following results:

Of the 904 Math items submitted for analysis, 813 (90%) fit the model sufficiently well to be retained.

The final item map for mathematics—showing the total distribution of items along the math difficulty scale—spanned 12 logits. This approximates 12 years of math ability.

Difficulty values for objectives were obtained by calculating the median difficulty level of an objective's items. These values allowed objectives to be positioned on an objective map, giving insight to the inherent difficulty of the objectives as perceived by student. This information can be used to answer questions like "How much more difficult is a given fifth-grade math skill than a given fourth-grade math skill?" or "Is it easier for second-graders to add four one-digit numbers requiring regrouping or two two-digit numbers requiring regrouping?" The final item pool has been organized by ranking items in order of increasing difficulty within each objective.

Tests constructed of these calibrated items can now be used to generate "item free" or "test free" person measures, for the Rasch Model can calibrate people the same way it calibrates items. Instead of mapping an item along the scale of difficulty, it can be used to map an individual along the same scale, now referred to as math ability. In addition, detailed analyses of an individual's fit can identify instances where the individual is not "behaving properly"; that is, the individual may be guessing, cheating, falling asleep, or simply not trying on certain items. The Rasch analysis can indicate to a teacher or counselor that the performance of that individual on that test was probably not a "true" measure for any of the above reasons and would certainly suggest that the score be suspect.

These are but some of the applications of latent trait theory to the field of education. The mathematics item pool developed through the IER/CRT Project represents a major step in merging state-of-the-art test theory with the day-to-day problems of individual student diagnosis and evaluation, instructional planning, curriculum development, and program evaluation. The future expansion of this bank, along with improved interpretation and reporting services, promises to further enhance the ability of schools to better meet the learning needs of each individual student.

USE OF THE OBJECTIVE ITEM BANK

The items and objectives of this bank represent a carefully validated yet flexible evaluation instrument. The unique characteristics of each district's educational program should be the key determiners of how the bank is used. It is crucial that the bank be viewed as a pliable evaluation tool, one tailored to districts' needs. To use the bank as a final product or the definitive statement in competency-based programming would be most unfortunate. It is crucial that each district carefully examine its own educational program, population, and policies before using the bank. Such self-analysis affords the best direction to proceed in using the objective bank well.

The following are some broad alternatives that a district can select from in using the objective-item bank. Do not feel constrained by these for there are probably as many uses as there are districts.

1. Overall Local Curriculum Assessment

This option involves the selection of those objectives that the district values to such a degree that an on-going evaluation of progress is desired. Once the critical objectives have been selected, the critical grades wherein the selected objectives should be achieved are also identified. Once a year those students who are attending the critical grades will be tested via the selected objectives and items. A minimum of 3–4 items per objective should be included on the annual test. Each item cluster is then scored so as to uncover any problems in the achievement of a specific objective. Individual student scores are not the focus of this type of evaluation, but rather group scores are the main concern. Should a specific objective not be achieved, decisions as to how to improve instruction in that area are developed.

2. Specific Curriculum Evaluation and Development

This option necessitates the involvement of staff members, administrators, the school board, and the community. The components of this option include:

A. the identification of specific teaching objectives for each grade by the above;
B. the selection of items that evaluate each objective. (This bank will evaluate some of the objectives; however, others will probably need to be developed);
C. an annual evaluation of every grade (not just the critical grades as in option one) in terms of each grade level's objective;
D. a re-evaluation of the curriculum for each grade level based on the annual test results;
E. the reformulation of specific teaching objectives as in item A.

3. Minimum Competencies

This option is probably the one most persons think of when hearing the phrase "Competency Based Education." Just as in option two, the involvement of teachers, administrator, school board, and community are crucial. Instead of selecting key teaching objectives for each grade level, however, only the critical, most basic teaching objectives are identified. Testing procedures are so clarified as to include a specific minimum score. The selection of such cut-off scores is left up to each district's concerns. Once cut-off scores are implemented, however, the responsibility of remediation and programming becomes more pressing.

4. Student Diagnostics and Programming

One of the most exciting options is that of using each of the objectives and items as a set of quizzes keyed to each child's developmental stage. If the child passes approximately 4 out of 5 items representative of a specific objective, this is noted specifically on each child's evaluation program. If the child fails the quiz, more instruction is given and another quiz on the same objective is administered. Since there are 5 to 8 items for most objectives, the development of alternative quizzes is possible. The focus of this option is individual student progression and monitoring of progress rather than group evaluations.

5. High School Articulation

This option permits eighth-grade teachers to use clearly defined objectives as points of discussion with high school personnel. Such specificity enhances the discussion concerning who should teach what since the objectives are so clearly present. Such discussions of specific objectives accents any discrepencies in what high school teachers think elementary school teachers should accomplish. With such clarity solutions can be formulated.

SUGGESTED REFERENCES

Hambleton, R. K., Swaminathan, H., Cook, L. L., Eignor, D. R. and Gifford, J. A. Developments in latent trait theory: Models, technical issues, and applications. *Review of Educational Research,* 1978, 48, 467–510.

Harris, C. W., Alkin, M. C., and Popham, W. J., Ed. Problems in Criterion-Referenced Measurement. *CBE Monograph Series in Evaluation,* 1974, Center for the Study of Evaluation, University of California, Los Angeles (No. 3).

Wright, B. D. Solving measurement problems with the Rasch Model. *Journal of Educational Measurement,* 1977, 14, 97–115.

Wright, B. D. *The Rasch Model for Test Construction and Person Measurement.* Paper prepared for the Fifth Annual Conference and Exhibition on Measurement and Evaluation, Office of the Los Angeles County Superintendent of Schools, Division of Program Evaluation, Research, and Pupil Services, March 14, 1978.

IER MATHEMATICS OBJECTIVES BY SUBTOPIC

Category	Code	Description	Median Difficulty
Addition and Subtraction	0020	Determining sums through 10.	3.620
	0050	Determining differences for facts through 10.	4.380
	0110	Identifying sums and differences through 18.	5.260
	0170	Determining the sums for 3 one-digit numerals.	6.005
	0180	Solving equations involving adding and subtracting.	6.015
	0230	Solving word problems of addition and subtraction of one- and two-digit numerals.	6.420
	0270	Adding and subtracting two-digit numerals with no regrouping.	6.570
	0320	Solving word problems requiring no regrouping.	7.535
	0350	Adding and subtracting two-digit numerals with regrouping.	7.785
	0370	Adding 3 or more two-digit addends requiring regrouping.	7.930
	0440	Adding with regrouping—two addends with four digits.	8.440
	0450	Solving word problems requiring regrouping.	8.540
	0500	Subtracting with regrouping—4-digit numerals.	9.025
	0510	Adding with regrouping—5-digit addends.	9.390
	0520	Subtracting with zeros and regrouping.	9.405
	0580	Subtracting with regrouping—4- or 5-digit numerals.	10.055

Category	Code	Description	Median Difficulty
Analysis of Number and System	0830	Determining products of integers.	12.210
	0990	Determining sums of integers.	13.135
	1000	Determining quotients of integers.	13.230
	1020	Identifying the reciprocal of any rational number.	13.385
Basic Operations	0680	Dividing with dividends and divisors having zeros.	11.335
	0750	Comparing integers.	11.840
	0820	Using a number line for addition of integers.	12.195
Decimals	0760	Adding decimals.	11.950
	0790	Recognizing decimals.	12.110
	0840	Identifying fractions for decimals.	12.340
	0900	Identifying decimals for fractions.	12.610
	0940	Subtracting decimals.	12.905
	1090	Identifying decimals for fractions.	14.125
	1120	Identifying decimal equivalents for common fractions.	14.305
Expanded and Scientific Notation	0950	Identifying expanded form of whole numbers using exponents.	12.915
Fractions	0530	Recognizing fractional parts of geometric figures.	9.625
	0610	Adding like fractions.	10.785
	0650	Identifying numerators and denominators.	11.025
	0670	Adding and subtracting fractions, mixed numbers and/or whole numbers.	11.270

Category	Code	Description	Median Difficulty
	0690	Expressing fractions in simplest terms.	11.485
	0700	Identifying the least common multiple.	11.495
	0720	Identifying equivalent fractions.	11.575
	0730	Identifying the least common denominator.	11.710
	0800	Recognizing mixed numbers for improper fractions.	12.140
	0880	Identifying fractions in lowest terms.	12.570
	0930	Subtracting fractions with regrouping.	12.875
	0970	Multiplying fractions or mixed numbers by whole numbers.	13.085
	0980	Adding and subtracting fractions with regrouping.	13.120
Geometry and Graphs	0080	Identify and name a square, triangle, rectangle, circle.	4.750
	0130	Matching shapes with names (square, rectangle, circle, triangle, oval).	5.370
	0200	Recognizing characteristics of triangles.	6.290
	0420	Reading bar graphs (answering questions after reading graph).	8.270
	0560	Reading bar graphs and picture graphs.	9.670
	0600	Identifying angles and geometric figures.	10.695
	0630	Identifying polygons.	10.845
	0640	Recognizing right angles.	10.955
	0870	Recognizing perpendicular and parallel lines.	12.480

Category	Code	Description	Median Difficulty
	0890	Identifying angles.	12.605
	0960	Using a protractor to measure angles.	12.975
	1030	Reading bar graphs (identifying data).	13.490
	1040	Identifying parts of a circle.	13.595
	1070	Determining area of a rectangle.	13.920
	1080	Reading line graphs.	14.115
	1100	Determining the area of a triangle.	14.170
	1140	Reading picture graphs (identifying data).	14.420
	1150	Using the perimeter formula.	14.810
Mathematical Properties and Relations	0210	Recognizing addition and subtraction as inverse operations.	6.310
	0280	Using symbols > < = for number relationships.	6.895
	0330	Recognizing the property of 1 and zero in multiplication and division.	7.745
Measurement	0100	Using proper measurement techniques.	5.220
	0120	Defining money: identifying and naming coins.	5.290
	0150	Measuring with nonstandard units.	5.835
	0160	Telling time to the half-hour.	5.930
	0240	Reading a calendar.	6.430
	0360	Defining money: deciding worth of coins.	7.840
	0480	Telling time to the quarter-hour.	8.920
	0620	Using knowledge of money.	10.815

Category	Code	Description	Median Difficulty
Multiplication and Division	0340	Recognizing multiplication as repeated addition.	7.765
	0400	Identifying multiplication equations for arrays.	8.040
	0410	Identifying families of facts.	8.135
	0460	Using 1-digit multipliers.	8.820
	0540	Dividing by 1-digit divisor with remainders.	9.635
	0550	Multiplying by tens.	9.670
	0570	Multiplying with 2-digit multipliers.	9.715
	0590	Using 1-digit divisors.	10.090
	0660	Dividing by 2-digit divisors.	11.195
	0740	Multiplying whole numbers and decimal fractions.	11.750
	0770	Multiplying decimal fractions.	11.970
	0860	Dividing a decimal fraction by a whole number.	12.475
	1010	Dividing a decimal fraction by a decimal fraction.	13.380
	1130	Dividing a whole number by a decimal fraction.	14.320
Numbers, Numerals, and Place Values	0010	Matching numerals with word names (1 through 99).	3.285
	0030	Matching word names and numerals.	3.860
	0060	Identifying ordinal number names through 10.	4.575
	0070	Writing word names for numerals 1 through 10.	4.575
	0090	Counting by 1's to 100.	4.805
	0140	Counting by 5's to 100.	5.740

Category	Code	Description	Median Difficulty
	0190	Recognizing place value for 2-digit numerals and expanded notation.	6.265
	0220	Recognizing place value for 3-digit numerals and word numbers.	6.355
	0250	Counting by 2's to 100.	6.440
	0260	Counting by 10's to 100.	6.520
	0290	Adding place values in 2-digit numerals.	6.915
	0310	Renaming numerals to 18 as combinations of different facts.	7.510
	0380	Recognizing place value for 3-digit numerals and expanded notation.	7.975
	0390	Recognizing place value for 2- or 3-digit numerals and number words.	8.040
	0430	Identifying 3-digit numerals for objects grouped by tens and ones.	8.285
	0470	Identifying numerals to 5 digits for word numbers.	8.860
	0490	Recognizing place value.	8.970
	0710	Rounding.	11.570
Prime and Composite Numbers	0920	Identifying prime factorization of composite numbers.	12.840
Problem-Solving	0785	Determining equations and solutions for word problems of subtraction.	12.095
	0810	Determining equations for word problems of addition.	12.155
	0850	Determining equations for word problems of multiplication.	12.410
	0910	Determining value of formulas.	12.675

Category	Code	Description	Median Difficulty
Ratio and percentage	1060	Identifying fractions, decimals, and percents.	13.645
Rational Numbers	1050	Dividing whole numbers by fractions or mixed numbers or vice-versa.	13.610
	1110	Dividing fractions and mixed numbers.	14.260
Sets	0040	Set membership and comparison.	4.040
	0300	Using > and < symbols.	7.245

OBJECTIVES

d = 3.285

0010 Matching numerals with their word names (1 through 99)

Given a list of five numerals between 1 and 99 which are out of sequence, the learner can name each numeral correctly.

Directions: Mark the number the teacher reads.

"Sixty-one"
1. A) 42
B) 53
C) 61
D) 84

"Nine"
2. A) 9
B) 11
C) 28
D) 46

"Three"
3. A) 1
B) 3
C) 9
D) 21

"Ninety-Nine"
4. A) 14
B) 69
C) 74
D) 99

"Seventy-Four"
5. A) 42
B) 56
C) 74
D) 92

d = 3.620

0020 Determining sums through 10.

Given combinations of addition facts between one and ten, the learner can identify the missing sums.

Directions: Mark the sum of the numbers given.

1. 1 + 4 =
   A) 2
   B) 3
   C) 4
   D) 5

2. 2 + 3 =
   A) 1
   B) 2
   C) 4
   D) 5

3. 3 + 1 =
   A) 5
   B) 4
   C) 2
   D) 3

4. 4 + 4 =
   A) 0
   B) 6
   C) 8
   D) 9

5. 3 + 5 =
   A) 8
   B) 2
   C) 11
   D) 15

6. 4 + 3 =
   A) 1
   B) 7
   C) 3
   D) 8

7. 6 + 3 =
   A) 3
   B) 2
   C) 8
   D) 9

d = 3.860

0030 Matching word names and numerals.

Given 7 word names and 7 numerals of the numbers 1 through 20, the learner will match the word names and numerals.

Directions: Mark the number the same as the word.

1. **Four**
   A) 2
   B) 4
   C) 6
   D) 10

2. **Nine**
   A) 3
   B) 7
   C) 9
   D) 10

3. **Fifteen**
   A) 8
   B) 11
   C) 12
   D) 15

4. **Ten**
   A) 4
   B) 8
   C) 10
   D) 17

5. **Seventeen**
   A) 12
   B) 14
   C) 15
   D) 17

6. **Six**
   A) 5
   B) 6
   C) 9
   D) 18

7. **Eleven**
   A) 11
   B) 13
   C) 18
   D) 20

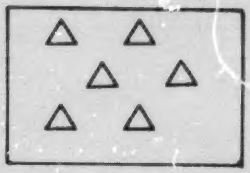
d = 4.040

0040 Set membership and comparison.

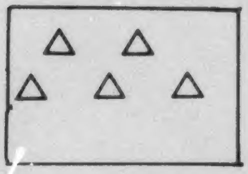
Given more than one subset, the learner will select the set with the fewest or most members as well as make comparisons between sets.

1. Mark the set that has the fewest members.

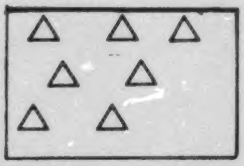
A)



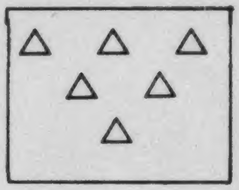
B)



C)

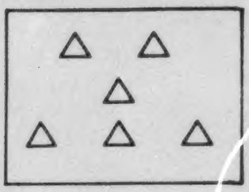


D)

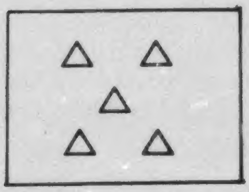


2. Mark the set that has the most members.

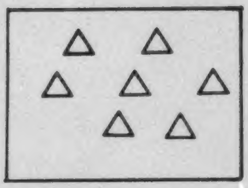
A)



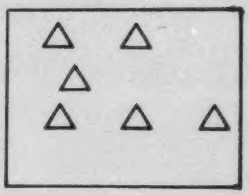
B)



C)

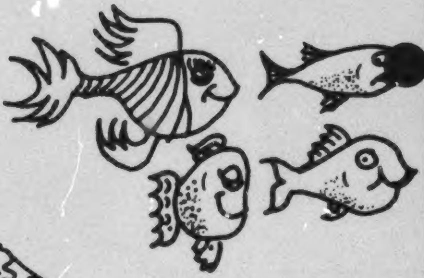


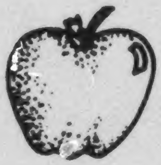
D)

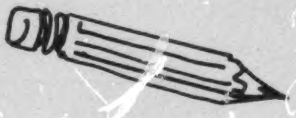


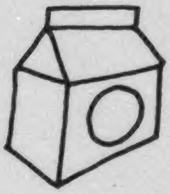
0040 (continued)

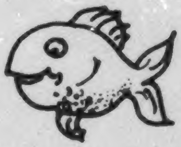
3. **Mark the object that belongs to the set.**



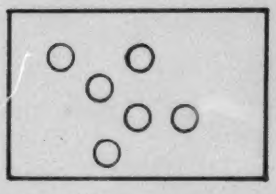
A) 

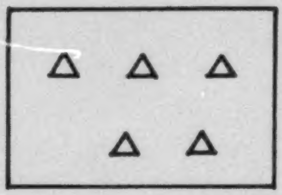
C) 

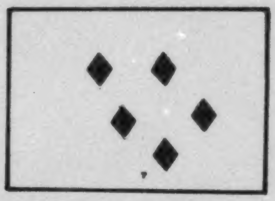
B) 

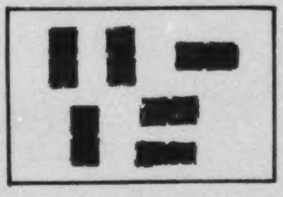
D) 

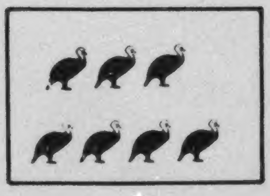
4. **Mark the set that has the same number of members as the set in the box at the right.**



A) 

C) 

B) 

D) 

d = 4.380

0050 Determining differences for facts through 10.

Given combinations of subtraction facts through 10, the learner can identify the missing differences.

Directions: Pick the correct answer to the subtraction problems.

1. **8 − 6 =**
A) 2
B) 3
C) 4
D) 5

2. **6 − 0 =**
A) 3
B) 4
C) 5
D) 6

3. **4 − 1 =**
A) 4
B) 3
C) 2
D) 1

4. **3 − 2 =**
A) 0
B) 1
C) 2

5. **9 − 2 =**
A) 5
B) 6
C) 7
D) 8

6. **5 − 2 =**
A) 2
B) 3
C) 4
D) 5

7. **8 − 2 =**
A) 5
B) 6
C) 7
D) 8

d = 4.575

0060 Identifying ordinal number names 1 through 10.

Given a list of numerals 1 through 10, the learner will identify the ordinal number name for each numeral.

Directions: Select the word that is equal to the numeral given.

1. $\boxed{2}$
   - A) First
   - B) Second
   - C) Fourth
   - D) Eighth

2. $\boxed{6}$
   - A) Fifth
   - B) Sixth
   - C) Ninth
   - D) Seventh

3. $\boxed{9}$
   - A) Eighth
   - B) Seventh
   - C) Ninth
   - D) Tenth

4. $\boxed{4}$
   - A) Second
   - B) Third
   - C) Fourth
   - D) Ninth

5. $\boxed{7}$
   - A) Sixth
   - B) Ninth
   - C) Fifth
   - D) Seventh

6. $\boxed{1}$
   - A) Second
   - B) Fourth
   - C) Third
   - D) First

d = 4.575

0070 Writing word names for numerals 1 through 10.

Given the numerals 1 through 10, the learner will write the word name for each numeral.

Directions: Select the word that is equal to the number given.

1. **2**
A) one
B) two
C) three
D) six

2. **5**
A) one
B) three
C) five
D) six

3. **4**
A) five
B) ten
C) four
D) seven

4. **7**
A) two
B) three
C) six
D) seven

5. **8**
A) seven
B) two
C) five
D) eight

6. **3**
A) four
B) three
C) one
D) ten

7. **9**
A) six
B) nine
C) three
D) four

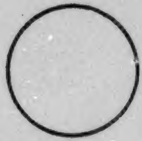
d = 4.750

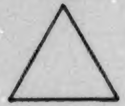
0080 Identifying and naming a square, triangle, rectangle, circle.

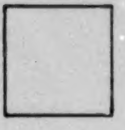
Given a picture of a square, rectangle, circle, triangle and a list of the names for these figures, the learner will match the shape with its name.

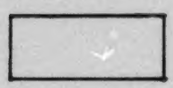
Directions: Pick the shape asked for in each question.

1. Which is a square?

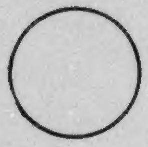
A) 

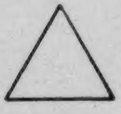
B) 

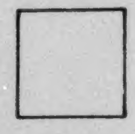
C) 

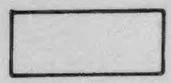
D) 

2. Which is a rectangle?

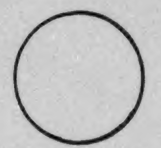
A) 

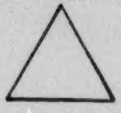
B) 

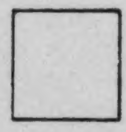
C) 

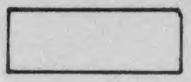
D) 

3. Which is a square?

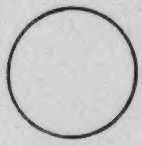
A) 

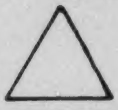
B) 

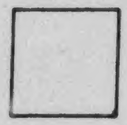
C) 

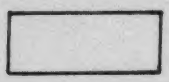
D) 

4. Which is a triangle?

A) 

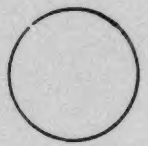
B) 

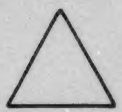
C) 

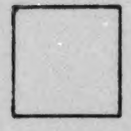
D) 

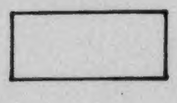
0080 (continued)

5. **Which is a rectangle?**

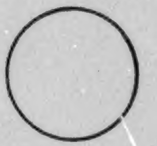
A) 

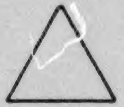
B) 

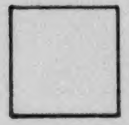
C) 

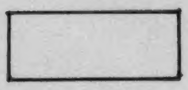
D) 

6. **Which is a circle?**

A) 

B) 

C) 

D) 

d = 4.805

0090 Counting by 1's to 100.

Given numerals 1–100 in correct numerical sequence with the middle numeral missing, the learner will identify the missing numerals correctly.

Directions: Select the number that completes the series of numbers in their correct order (sequential series).

1. **75, 76, ______, 78, 79**
   A) 77
   B) 80
   C) 74
   D) 73

2. **82, 83, ______, 85, 86**
   A) 80
   B) 87
   C) 84
   D) 81

3. **86, 87, ______, 89, 90**
   A) 91
   B) 84
   C) 83
   D) 88

4. **5, 6, ______, 8, 9**
   A) 4
   B) 2
   C) 7
   D) 11

5. **89, 90, ______, 92, 93**
   A) 88
   B) 91
   C) 94
   D) 87

6. **11, 12, ______, 14, 15**
   A) 10
   B) 16
   C) 13
   D) 9

7. **50, 51, ______, 53, 54**
   A) 49
   B) 55
   C) 57
   D) 52

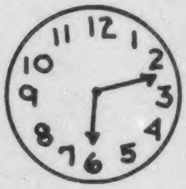
8. **34, 35, ______, 37, 38**
   A) 39
   B) 36
   C) 33
   D) 30

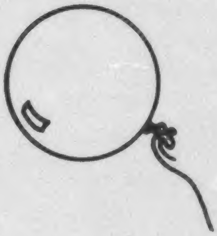
d = 5.220

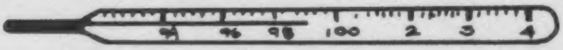
0100 Using proper measurement techniques.

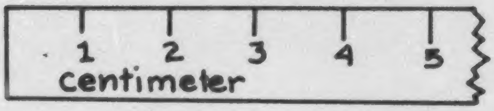
The learner will determine the best way to measure an object, or what objects are used for certain operations.

1. Which do you use to tell time?

A) 
12
1
2
3
4
5
6
7
8
9
10
11

B) 

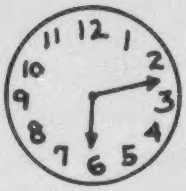
C) 
94
96
98
100
2
3
4

D) 
1
2
3
4
5
centimeter

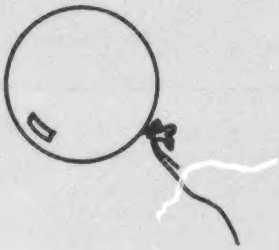
0100 (continued)

2. Which do you use to tell how long something is?

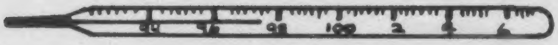
A)


12
1
2
3
4
5
6
7
8
9
10
11

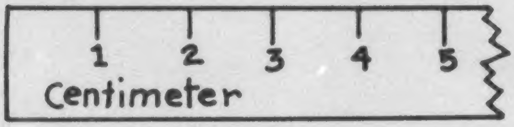
B)



C)


94
96
98
100
2
4
6

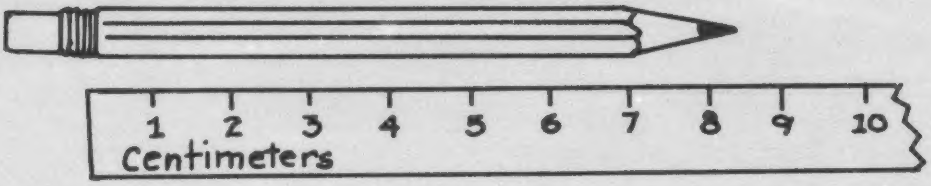
D)


1
2
3
4
5
Centimeter

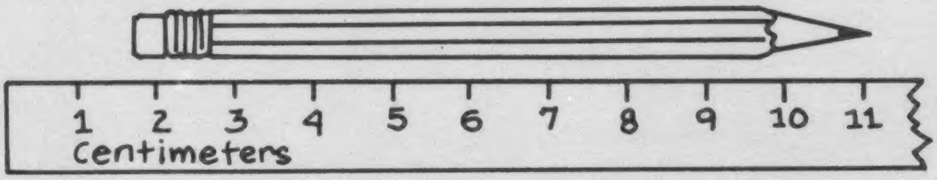
0100 (continued)

3. **Which shows how to measure the pencil?**

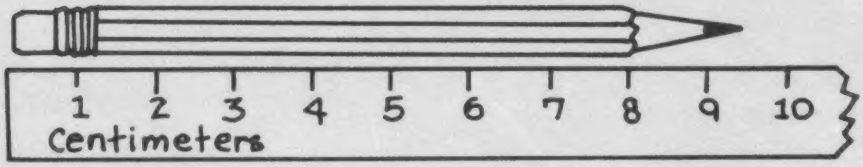
A)


1 2 3 4 5 6 7 8 9 10
Centimeters

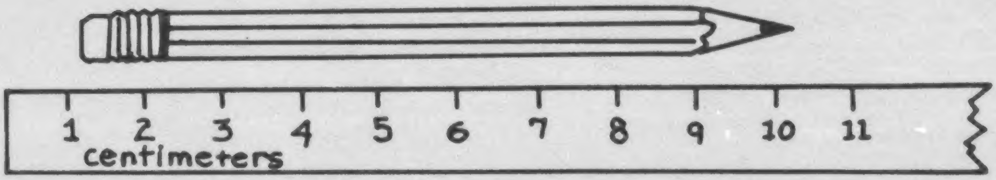
B)


1 2 3 4 5 6 7 8 9 10 11
Centimeters

C)


1 2 3 4 5 6 7 8 9 10
Centimeters

D)


1 2 3 4 5 6 7 8 9 10 11
centimeters

0110 Identifying sums and differences through 18.

The learner will identify all sums or differences, as directed, for addition and subtraction problems for combinations of sums through 18.

Directions: Mark the sum or difference of the numbers given.

1. **4 − 2 =**
   A) o
   B) 2
   C) 4
   D) 6

2. **6 − 3 =**
   A) 18
   B) 9
   C) 4
   D) 3

3. **3 + 5 =**
   A) 15
   B) 2
   C) 8
   D) 7

4. **5 + 9 =**
   A) 12
   B) 14
   C) 4
   D) 15

5. **15 − 9 =**
   A) 6
   B) 8
   C) 24
   D) 9

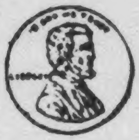
6. **18 − 9 =**
   A) 18
   B) 27
   C) 8
   D) 9

7. **9 + 8 =**
   A) 18
   B) 1
   C) 19
   D) 17

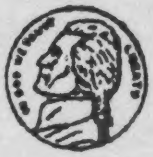
d = 5.290

0120 Defining money: Identifying and naming coins.

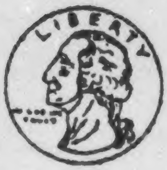
Directions: Name the coins.

1. 

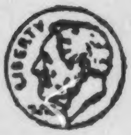
A) penny
B) nickel
C) dime
D) quarter

3. 

A) penny
B) nickel
C) dime
D) quarter

2. 

A) penny
B) nickel
C) dime
D) quarter

4. 

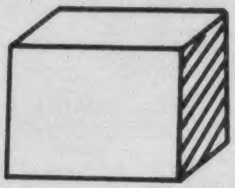
A) penny
B) nickel
C) dime
D) quarter

d = 5.370

0130 Matching shapes with names (box, ball, cone, can).

Given geometric shapes (box, ball, cone, can), the learner will be able to specify the correct name for each.

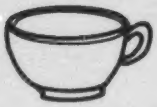
1. **This is a**



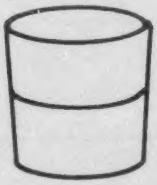
A) Ball
B) Cone
C) Can
D) Box

2. **Which has the shape of a ball?**

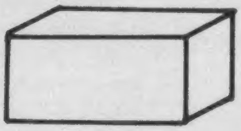
A)



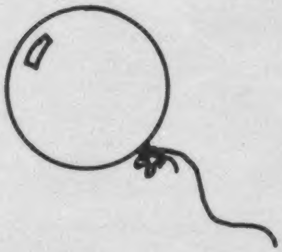
B)



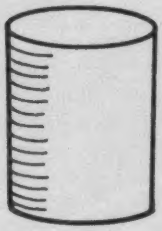
C)



D)

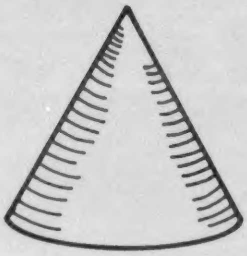


3. **This is a:**



A) Cone
B) Box
C) Can
D) Ball

4. **This is a:**



A) Can
B) Cone
C) Ball
D) Box

d = 5.740

0140 Counting by 5's to 100.

Given the numerals 5–100 counting by 5's and in correct numerical sequence, with the middle numeral missing, the learner will identify the missing numeral correctly.

Directions: Select the number that is missing and that completes the following series of numbers (increased by 5).

1. **5, 10, ______, 20, 25**
   A) 15
   B) 11
   C) 12
   D) 16

2. **20, 25, ______, 35, 40**
   A) 26
   B) 34
   C) 30
   D) 32

3. **65, 70, ______, 80, 85**
   A) 71
   B) 74
   C) 79
   D) 75

4. **25, 30, ______, 40, 45**
   A) 31
   B) 39
   C) 35
   D) 42

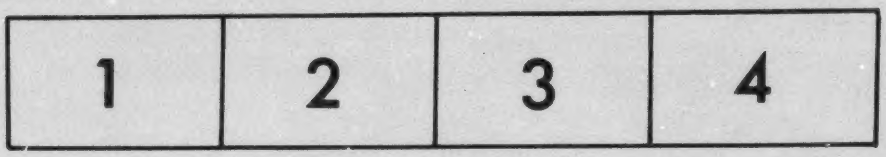
5. **80, 85, ______, 95, 100**
   A) 86
   B) 94
   C) 92
   D) 90

6. **42, 47, ______, 57, 62**
   A) 48
   B) 52
   C) 56
   D) 55

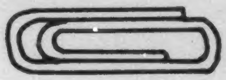
d = 5.835

0150 Measuring with non-standard units.

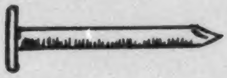
Directions: Using the scale at the top of the page, select the number that shows the right length (size) of each object below.



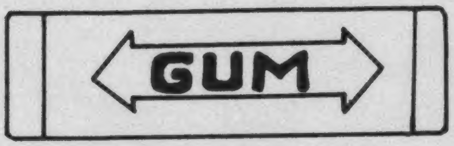
1. **PAPER CLIP**
   A) 1
   B) 2
   C) 3
   D) 4



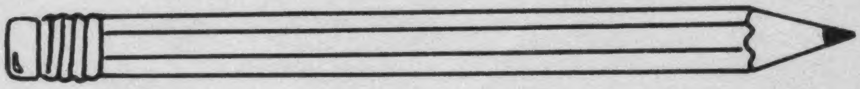
2. **NAIL**
   A) 1
   B) 2
   C) 3
   D) 4



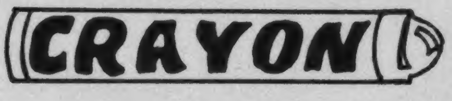
3. **GUM**
   A) 1
   B) 2
   C) 3
   D) 4



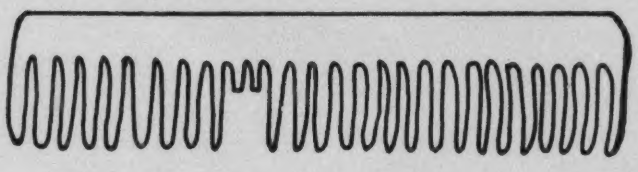
4. **PENCIL**
   A) 1
   B) 2
   C) 3
   D) 4



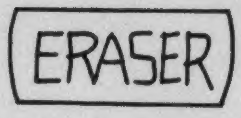
5. **CRAYON**
   - A) 1
   - B) 2
   - C) 3
   - D) 4



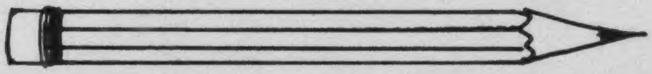
6. **COMB**
   - A) 1
   - B) 2
   - C) 3
   - D) 4



7. **ERASER**
   - A) 1
   - B) 2
   - C) 3
   - D) 4



8. **PENCIL**
   - A) 1
   - B) 2
   - C) 3
   - D) 4



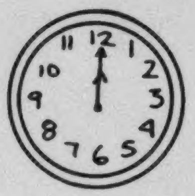
d = 5.930

0160 Telling time to the half-hour.

Given clock faces picturing time to the half-hour, the learner will identify the time for each.

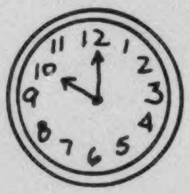
Directions: Choose the time shown on the clock.

1.


12
1
2
3
4
5
6
7
8
9
10
11

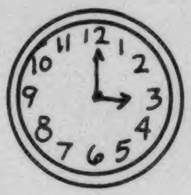
A) 6:00
B) 4:30
C) 9:00
D) 12:00

2.


12
1
2
3
4
5
6
7
8
9
10
11

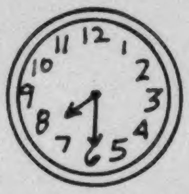
A) 11:00
B) 9:00
C) 2:30
D) 10:00

3.


12
1
2
3
4
5
6
7
8
9
10
11

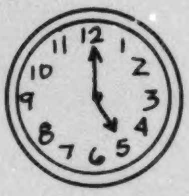
A) 3:00
B) 4:00
C) 9:00
D) 10:00

4.


12
1
2
3
4
5
6
7
8
9
10
11

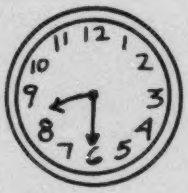
A) 6:30
B) 6:00
C) 7:30
D) 9:00

5.



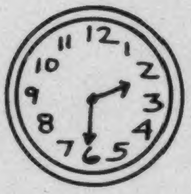
A) 12:00
B) 6:00
C) 5:00
D) 12:50

6.



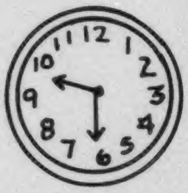
A) 9:30
B) 8:30
C) 6:00
D) 5:30

7.



A) 6:15
B) 2:30
C) 6:30
D) 2:60

8.



A) 6:00
B) 10:30
C) 5:00
D) 9:30

0170 Determining the sums for 3 one-digit numerals.

The learner will determine the sums for 3 one-digit addends in column addition through the sums of 18.

Directions: Mark the sums of the three numbers given.

1. $\begin{array}{r} 6 \\ 6 \\ +3 \\ \hline \end{array}$

A) 12
B) 15
C) 17
D) 18

2. $\begin{array}{r} 2 \\ 3 \\ +9 \\ \hline \end{array}$

A) 9
B) 12
C) 13
D) 14

3. $\begin{array}{r} 2 \\ 3 \\ +2 \\ \hline \end{array}$

A) 5
B) 7
C) 1
D) 9

4. $\begin{array}{r} 7 \\ 6 \\ +1 \\ \hline \end{array}$

A) 9
B) 13
C) 14
D) 16

5. $\begin{array}{r} 4 \\ 3 \\ +1 \\ \hline \end{array}$

A) 8
B) 4
C) 6
D) 9

6. $\begin{array}{r} 4 \\ 6 \\ +8 \\ \hline \end{array}$

A) 16
B) 17
C) 18
D) 19

d = 6.015

0180 Solving equations involving adding and subtracting.

Directions: Mark the sum or difference of the numbers given.

1.
$$\begin{array}{r} 20 \\ +\ 5 \\ \hline \end{array}$$
A) 25
B) 15
C) 60
D) 80

2.
$$\begin{array}{r} 3 \\ +4 \\ \hline \end{array}$$
A) 1
B) 7
C) 6
D) 9

3.
$$\begin{array}{r} 8 \\ -3 \\ \hline \end{array}$$
A) 3
B) 4
C) 5
D) 11

4.
$$\begin{array}{r} 12 \\ -\ 3 \\ \hline \end{array}$$
A) 4
B) 9
C) 15
D) 36

5.
$$\begin{array}{r} 10 \\ -\ 6 \\ \hline \end{array}$$
A) 16
B) 61
C) 5
D) 4

6.
$$\begin{array}{r} 14 \\ -\ 8 \\ \hline \end{array}$$
A) 4
B) 18
C) 6
D) 22

7.
$$\begin{array}{r} 6 \\ +10 \\ \hline \end{array}$$
A) 16
B) 60
C) 61
D) 70

8.
$$\begin{array}{r} 7 \\ +9 \\ \hline \end{array}$$
A) 2
B) 13
C) 15
D) 16

d = 0.000

0190 Recognizing place value for two-digit numerals and expanded notation.

The learner will identify the two-digit numeral and the expanded notation of the same value.

Directions: Which numbers mean the same as the number at the top of each problem?

1. 43 =
A) 40 + 3
B) 40 + 30
C) 30 + 4
D) 30 + 40

2. 76 =
A) 7 + 6
B) 70 + 6
C) 60 + 7
D) 70 + 60

3. 88 =
A) 80 + 8
B) 8 + 8
C) 80 + 80
D) 88 + 8

4. 92 =
A) 90 + 20
B) 9 + 20
C) 90 + 2
D) 9 + 2

5. 52 =
A) 5 + 2
B) 50 + 2
C) 20 + 5
D) 50 + 20

6. 39 =
A) 3 + 90
B) 90 + 3
C) 30 + 9
D) 30 + 90

7. 84 =
A) 8 + 4
B) 80 + 40
C) 40 + 80
D) 80 + 4

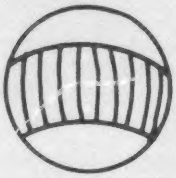
8. 19 =
A) 10 + 90
B) 19 + 1
C) 10 + 9
D) 90 + 10

d = 6.290

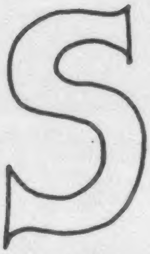
0200 Recognizing characteristics of triangles.

Given a selection of geometric shapes which include a variety of triangles, the learner can identify all the triangles.

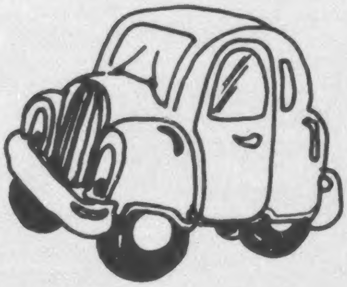
Directions: Decide whether or not each of the figures contains a triangle.

1. 

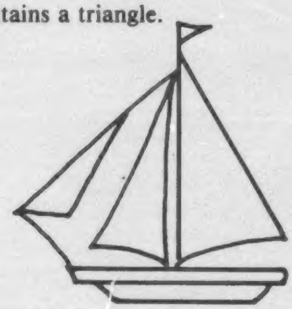
A) Yes
B) No

2. 

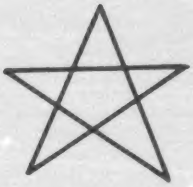
A) Yes
B) No

3. 

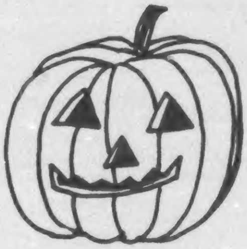
A) Yes
B) No

4. 

A) Yes
B) No

5. 

A) Yes
B) No

6. 

A) Yes
B) No

0210 Recognizing addition and subtraction as inverse operations.

The learner will identify the equation that is the inverse operation for an addition or subtraction equation for facts through 10.

Directions: Decide which number belongs in the blank of each equation.

1. **If 5 + 6 = 11**
   Then 11 − $\boxed{?}$ = 5
   A) 2
   B) 4
   C) 6
   D) 9

2. **If 8 − 6 = 2**
   Then 2 + 6 = $\boxed{?}$
   A) 2
   B) 4
   C) 6
   D) 8

3. **If 14 − 5 = 9**
   Then 9 + $\boxed{?}$ = 14
   A) 4
   B) 5
   C) 11
   D) 19

4. **If 8 + 9 = 17**
   Then 17 − $\boxed{?}$ = 8
   A) 8
   B) 9
   C) 17
   D) 11

5. **If 19 + 2 = 21**
   Then 21 − $\boxed{?}$ = 19
   A) 2
   B) 3
   C) 19
   D) 27

6. **If 10 + 5 = 15**
   Then $\boxed{?}$ − 5 = 10
   A) 5
   B) 15
   C) 20
   D) 25

7. **If 3 + 9 = 12**
   Then $\boxed{?}$ − 9 = 3
   A) 3
   B) 6
   C) 9
   D) 12

8. **If 7 − 4 = 3**
   Then 4 + $\boxed{?}$ = 7
   A) 3
   B) 4
   C) 7
   D) 10

d = 6.355

0220 Recognizing place value for three-digit numerals and word numbers.

The learner will identify the three-digit numeral and the word numbers of the same value.

Directions: Choose the correct answer for the number given

1. **5 hundreds, 3 tens and 6 ones**
   - A) 536
   - B) 50306
   - C) 500306
   - D) 635

2. **3 hundreds, 9 tens and 7 ones**
   - A) 397
   - B) 3097
   - C) 300907
   - D) 793

3. **8 hundreds, 7 tens and 2 ones**
   - A) 800792
   - B) 872
   - C) 80702
   - D) 278

4. **1 hundred, 8 tens and 0 ones**
   - A) 100800
   - B) 180
   - C) 10800
   - D) 801

5. **2 hundreds, 6 tens and 3 ones**
   - A) 2063
   - B) 362
   - C) 263
   - D) 200603

6. **9 hundreds, 0 tens and 1 one**
   - A) 90001
   - B) 109
   - C) 9001
   - D) 901

7. **3 hundreds, 1 ten and 0 ones**
   - A) 300100
   - B) 301
   - C) 310
   - D) 3010

8. **6 hundreds, 0 tens and 4 ones**
   - A) 60004
   - B) 406
   - C) 6004
   - D) 604

d = 6.420

0230 Solving word problems of addition and subtraction of one- and two-digit numerals.

The learner will solve word problems of addition and subtraction involving 2 or 3 one- and two-digit numerals through the sums of 20.

Directions: Solve the word problems of adding and subtracting.

1. **3 cats. 5 dogs. How many animals in all?**
   A) 2
   B) 4
   C) 7
   D) 8

2. **In the first grade class, there are 11 girls and 8 boys. *How many* children are in the class?**
   A) 2
   B) 3
   C) 11
   D) 19

3. **Jack's family drove to the lake. They drove 5 miles on the way to the lake and 5 miles on the way back. *How many* miles did they drive both ways?**
   A) 5
   B) 10
   C) 15
   D) 20

4. **Jan saw 14 robins. 9 flew away. *How many* were left?**
   A) 23
   B) 5
   C) 6
   D) 10

5. **Betty took 12 pennies to school. When she got to school, she only had 3 pennies left. *How many* pennies did she lose?**
   A) 3
   B) 9
   C) 12
   D) 15

6. **Spiders have 8 legs. Ants have 6 legs. *How many* more legs do spiders have than ants?**
   A) 2
   B) 14
   C) 5
   D) 10

7. **Andy is 7 years old. His brother Tom is 11 years old. *How much* older is Tom than Andy?**
   A) 4
   B) 7
   C) 11
   D) 18

d = 6.430

0240 Reading a calendar.

Given a calendar and a list of dates, the learner can identify the day of the week on which each date falls.

Directions: Choose the day of the week for dates on the calendar at the top of the page.

MAY, 1979

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

1. May 25
   - A) Friday
   - B) Monday
   - C) Thursday
   - D) Wednesday

2. May 16
   - A) Monday
   - B) Wednesday
   - C) Thursday
   - D) Friday

3. May 22
   - A) Monday
   - B) Saturday
   - C) Friday
   - D) Tuesday

4. May 4
   - A) Monday
   - B) Thursday
   - C) Friday
   - D) Saturday

5. May 26
   - A) Tuesday
   - B) Saturday
   - C) Friday
   - D) Monday

6. May 7
   - A) Friday
   - B) Monday
   - C) Sunday
   - D) Wednesday

7. May 8
   - A) Wednesday
   - B) Thursday
   - C) Tuesday
   - D) Saturday

8. May 13
   - A) Saturday
   - B) Tuesday
   - C) Thursday
   - D) Sunday

d = 6.440

0250 Counting by 2's to 100.

Given the numerals 2–100 counting by 2's in sets of 5 and in correct numerical sequence, with the middle numeral missing, the learner will identify the missing numerals correctly.

Directions: Select the number that completes the series of numbers (even numbers increased by 2).

1. **18, 20, $\boxed{?}$, 24, 26**
   - A) 28
   - B) 22
   - C) 30
   - D) 14

2. **4, 6, $\boxed{?}$, 10, 12**
   - A) 2
   - B) 7
   - C) 8
   - D) 9

3. **28, 30, $\boxed{?}$, 34, 36**
   - A) 38
   - B) 26
   - C) 31
   - D) 32

4. **46, 48, $\boxed{?}$, 52, 54**
   - A) 49
   - B) 50
   - C) 51
   - D) 53

5. **78, 80, $\boxed{?}$, 84, 86**
   - A) 81
   - B) 83
   - C) 82
   - D) 85

6. **88, 90, $\boxed{?}$, 94, 96**
   - A) 91
   - B) 89
   - C) 97
   - D) 92

d = 6.520

0260 Counting by 10's to 100.

Given the numerals 10–100 counting by 10's in groups of 5 and in correct numerical sequence, with the middle numeral missing, the learner will identify the missing numerals correctly.

Directions: Select the number that completes the series of numbers (increased by 10).

1. **30, 40, $\boxed{?}$, 60, 70**
   A) 42
   B) 59
   C) 50
   D) 80

2. **0, 10, $\boxed{?}$, 30, 40**
   A) 11
   B) 20
   C) 29
   D) 31

3. **52, 62, $\boxed{?}$, 82, 92**
   A) 63
   B) 81
   C) 100
   D) 72

4. **62, 72, $\boxed{?}$, 92, 102**
   A) 73
   B) 90
   C) 91
   D) 82

5. **29, 39, $\boxed{?}$, 59, 69**
   A) 49
   B) 40
   C) 58
   D) 60

6. **39, 49, $\boxed{?}$, 69, 79**
   A) 29
   B) 59
   C) 50
   D) 68

7. **44, 54, $\boxed{?}$, 74, 84**
   A) 55
   B) 62
   C) 64
   D) 73

8. **25, 35, $\boxed{?}$, 55, 65**
   A) 45
   B) 36
   C) 54
   D) 75

d = 6.570

0270 Adding and subtracting two-digit numerals with no regrouping.

The learner will determine sums and differences for two-digit numerals in column form with no regrouping.

Directions: Mark the sum or difference of the two numbers given.

1. $\begin{array}{r} 30 \\ +10 \\ \hline \end{array}$

A) 20
B) 30
C) 31
D) 40

2. $\begin{array}{r} 79 \\ -46 \\ \hline \end{array}$

A) 33
B) 58
C) 113
D) 43

3. $\begin{array}{r} 54 \\ +23 \\ \hline \end{array}$

A) 77
B) 31
C) 71
D) 37

4. $\begin{array}{r} 65 \\ +14 \\ \hline \end{array}$

A) 51
B) 89
C) 79
D) 71

5. $\begin{array}{r} 41 \\ +37 \\ \hline \end{array}$

A) 16
B) 18
C) 78
D) 88

6. $\begin{array}{r} 25 \\ -10 \\ \hline \end{array}$

A) 15
B) 16
C) 30
D) 32

7. $\begin{array}{r} 57 \\ -16 \\ \hline \end{array}$

A) 11
B) 23
C) 41
D) 61

8. $\begin{array}{r} 84 \\ -21 \\ \hline \end{array}$

A) 105
B) 65
C) 53
D) 63

d = 6.895

0280 Using symbols <, >, = for number relationships.

Directions: Decide whether the *less than* or *greater than* sign belongs between the two numbers and select the symbol that fits correctly.

1. $10 \boxed{?} 9$
A) >
B) <

2. $9 \boxed{?} 7$
A) >
B) <

3. $5 \boxed{?} 6$
A) >
B) <

4. $3 \boxed{?} 2$
A) >
B) <

5. $94 \boxed{?} 76$
A) >
B) <

6. $3 \boxed{?} 4$
A) >
B) <

7. $21 \boxed{?} 39$
A) >
B) <

8. $24 \boxed{?} 38$
A) >
B) <

d = 6.915

0290 Adding place-values in two-digit numerals.

Directions: Choose the number described by the sentence.

1. **5 tens and 7 ones =**
   A) 57
   B) 12
   C) 2
   D) 75

2. **4 tens and 3 ones =**
   A) 3
   B) 7
   C) 34
   D) 43

3. **6 tens and 2 ones =**
   A) 12
   B) 26
   C) 62
   D) 8

4. **3 tens and 4 ones =**
   A) 1
   B) 7
   C) 17
   D) 34

5. **1 ten and 0 ones =**
   A) 0
   B) 10
   C) 1
   D) 100

6. **7 tens and 6 ones =**
   A) 67
   B) 76
   C) 11
   D) 13

7. **2 tens and 3 ones =**
   A) 5
   B) 32
   C) 23
   D) 1

8. **9 tens and 5 ones =**
   A) 4
   B) 95
   C) 59
   D) 14

d = 7.245

0300 Using > and < symbols.

Given pairs of two digit numerals, the learner will use the > or < symbol to make the number sentence true.

Directions: Decide whether the *less than* or *greater than* sign belongs between the two numbers and select the symbol that fits correctly.

1. 72 $\boxed{?}$ 27
   A) >
   B) <

2. 20 $\boxed{?}$ 30
   A) >
   B) <

3. 11 $\boxed{?}$ 20
   A) >
   B) <

4. 91 $\boxed{?}$ 88
   A) >
   B) <

d = 7.510

0310 Renaming numerals to 18 as combinations of different facts.

Given addition and subtraction equations for the same number from 1-18 with one addend or one subtrahend missing, the learner will identify the missing numeral.

Directions: Choose the number that finishes the sentence or equation.

1. $15 - 9 = \boxed{?} + 0 = 6$
   - A) 5
   - B) 6
   - C) 4
   - D) 3

2. $13 - \boxed{?} = 2 + 2 + 2 = 6$
   - A) 6
   - B) 7
   - C) 3
   - D) 4

3. $2 + 3 + 5 = 13 - \boxed{?} = 10$
   - A) 2
   - B) 3
   - C) 4
   - D) 5

4. $12 - \boxed{?} = 1 + 3 + 5 = 9$
   - A) 4
   - B) 2
   - C) 3
   - D) 5

5. $3 + 2 + 4 = 13 - \boxed{?} = 9$
   - A) 3
   - B) 2
   - C) 9
   - D) 4

6. $2 + 3 + 6 = 15 - \boxed{?} = 11$
   - A) 6
   - B) 2
   - C) 4
   - D) 3

7. $15 - 7 = 2 + 2 + \boxed{?} = 8$
   - A) 4
   - B) 3
   - C) 6
   - D) 5

d = 7.535

0320 Solving word problems requiring no regrouping.

The learner will use addition and subtraction to solve word problems involving the use of two-digit numerals and no regrouping.

Directions: Solve the word problems.

1. **12 red balloons. 6 blue balloons. How many in all?**
   A) 18
   B) 6
   C) 2
   D) 72

2. **55 balloons were in a box. Nancy used 41 of these balloons for a party. How many balloons were left in the box?**
   A) 96
   B) 24
   C) 14

3. **There were 47 oranges in a box. 22 of these oranges were removed. Then how many oranges were in the box?**
   A) 69
   B) 15
   C) 25

4. **John has 56 marbles in his bag. Joey has 43 marbles in his bag. John has how many marbles more than Joey?**
   A) 13
   B) 99
   C) 23

5. **84 children. 27 desks. How many more desks are needed?**
   A) 111
   B) 67
   C) 63
   D) 57

6. **15 stamps on a page. 3 in each row. How many rows?**
   A) 18
   B) 12
   C) 45
   D) 5

d = 7.745

0330 Recognizing the property of one and zero in multiplcation and division.

The learner will use the multiplication property of one and zero in multiplication by correctly completing given equations.

Directions: Select the correct answer for the problem.

1. $\boxed{?} \times 25 = 25$
   A) 25
   B) 1
   C) 0

2. $98 \times 1 = \boxed{?}$
   A) 98
   B) 1
   C) 99
   D) 981

3. $10 \times 1 = \boxed{?}$
   A) 1
   B) 11
   C) 10
   D) 101

4. $26 \div 1 = \boxed{?}$
   A) 26
   B) 1
   C) 0
   D) 27

5. $0 \times 13 = \boxed{?}$
   A) 13
   B) 0
   C) 130

6. $0 \times 6 = \boxed{?}$
   A) 6
   B) 0
   C) 60
   D) 1

d = 7.765

0340 Recognizing multiplication as repeated addition for products to 81.

The learner will identify the repeated addition facts for products to 81.

Directions: Choose the answer that completes the sentence or equation and makes it true.

1. 2 X 5 =
   A) 5 + 5
   B) 5 X 5
   C) 5 – 5
   D) 2 + 2

2. 3 X 9 =
   A) 3 + 3 + 3
   B) 9 + 9 + 9
   C) (3 + 9) + (3 + 9)
   D) (3 + 3 + 3) + (9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9)

3. 4 X 7 =
   A) 4 + 4 + 4 + 4 + 4
   B) (4 + 4 + 4 + 4) + (7 + 7 + 7 + 7 + 7 + 7 + 7)
   C) (4 + 7) + (4 + 7)
   D) 7 + 7 + 7 + 7

4. 4 X 3 =
   A) 3 + 3 + 3 + 3
   B) 3 + 4
   C) 4 + 4 + 4 + 4
   D) 4 – 3

5. 5 X 4 =
   A) (5 + 5 + 5 + 5 + 5) + (4 + 4 + 4 + 4)
   B) 5 + 5 + 5 + 5 + 5
   C) 4 + 4 + 4 + 4 + 4
   D) (5 + 4) + (5 + 4)

0340 (continued)

6. 7 X 6 =
   - A) 7 + 7 + 7 + 7 + 7 + 7 + 7
   - B) (7 + 7 + 7 + 7 + 7 + 7 + 7) + (6 + 6 + 6 + 6 + 6 + 6)
   - C) (4 + 3) + (3 + 3)
   - D) 6 + 6 + 6 + 6 + 6 + 6 + 6

7. 8 X 4 =
   - A) (8 + 4) + (8 + 4)
   - B) 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4
   - C) 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8
   - D) (8 + 8 + 8 + 8 + 8 + 8 + 8 + 8) + (4 + 4 + 4 + 4)

8. 9 X 8 =
   - A) (4 + 5) + (4 + 4)
   - B) 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8
   - C) (9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9) + (8 + 8 + 8 + 8 + 8 + 8 + 8 + 8)
   - D) 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9

d = 7.785

0350 Adding and subtracting two-digit numerals with regrouping.

Given addition and subtraction problems of two-digit numerals requiring regrouping of tens and ones for solution, the learner will determine the sums and differences.

Directions: Choose the correct answer.

1. $\begin{array}{r} 27 \\ +\,39 \\ \hline \end{array}$

A) 56
B) 516
C) 66
D) 12

2. $\begin{array}{r} 37 \\ +\,46 \\ \hline \end{array}$

A) 73
B) 83
C) 71
D) 11

3. $\begin{array}{r} 84 \\ -\,76 \\ \hline \end{array}$

A) 18
B) 12
C) 10
D) 8

4. $\begin{array}{r} 89 \\ +\,37 \\ \hline \end{array}$

A) 1116
B) 116
C) 126
D) 1216

5. $\begin{array}{r} 61 \\ -\,18 \\ \hline \end{array}$

A) 53
B) 43
C) 57
D) 47

6. $\begin{array}{r} 72 \\ -\,36 \\ \hline \end{array}$

A) 46
B) 36
C) 108
D) 44

7. $\begin{array}{r} 91 \\ -\,38 \\ \hline \end{array}$

A) 67
B) 69
C) 53
D) 63

8. $\begin{array}{r} 84 \\ -\,17 \\ \hline \end{array}$

A) 67
B) 73
C) 63
D) 77

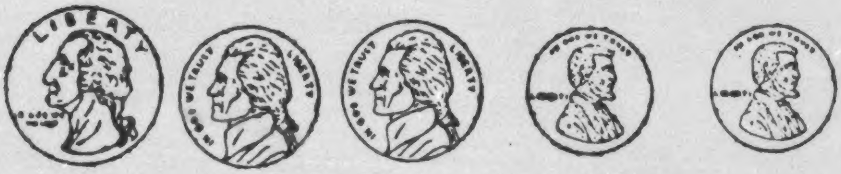
d = 7.840

0360 Defining money; deciding worth of coins.

The learner will orally define money as something that buys things and that penny, nickel, dime, quarter, dollar are kinds of money. The learner will be able to add up combinations of coins.

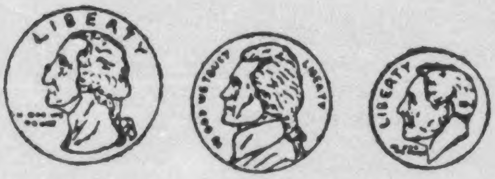
Directions: Answer these questions about sets of coins.

1. **How much are these coins worth?**


LIBERTY
IN GOD WE TRUST
LIBERTY
IN GOD WE TRUST
LIBERTY
IN GOD WE TRUST
IN GOD WE TRUST

A) 29¢
B) 65¢
C) 37¢
D) 47¢

2. **How much are these coins worth?**

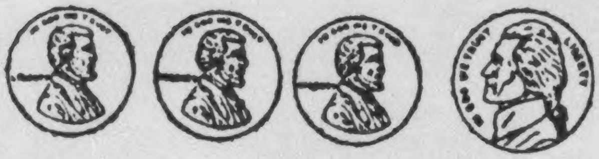

LIBERTY
IN GOD WE TRUST
LIBERTY
LIBERTY

A) 35¢
B) 45¢
C) 37¢
D) 40¢

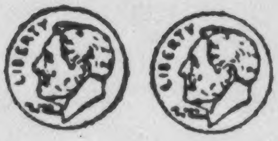
0360 (continued)

3. **You have 25¢. You spend 17¢. Your change is:**

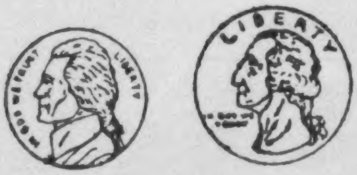
A) ______



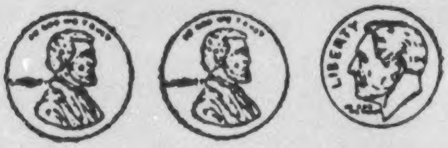
B) ______



C) ______

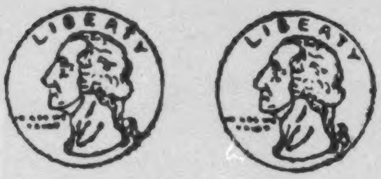


D) ______

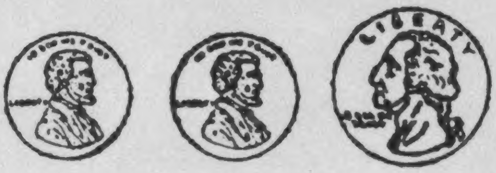


4. **You have 75¢. You spend 30¢. Your change is:**

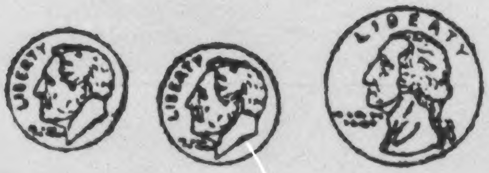
A) ______



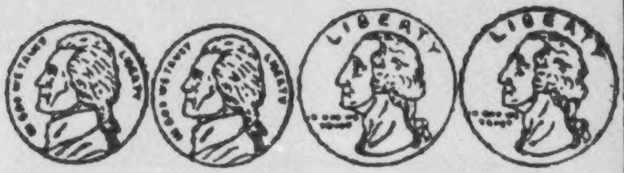
B) ______



C) ______



D) ______



d = 7.930

0370 Adding three or more two-digit addends requiring regrouping.

Given addition problems of three two-digit addends with regrouping of ones to tens place required for solution, the learner will determine the sums.

Directions: Choose the correct answer.

1.
23
37
+ 59

A) 109
B) 119
C) 191
D) 143

2.
73
28
+ 56

A) 157
B) 1417
C) 1517
D) 147

3.
10
54
93
+ 85

A) 2312
B) 2412
C) 232
D) 242

4.
88
68
+ 41

A) 1817
B) 197
C) 187
D) 1919

5.
46
94
+ 95

A) 235
B) 2215
C) 2315
D) 225

6.
4
14
45
+ 87

A) 1320
B) 130
C) 1520
D) 150

7.
68
72
+ 58

A) 188
B) 1818
C) 1918
D) 198

8.
81
97
38
+ 38

A) 244
B) 254
C) 354
D) 272

d = 7.975

0380 Recognizing place value for three-digit numerals and expanded notation.

The learner will identify the three-digit numeral and the expanded notation of the same value.

Directions: Choose the answer that has the same value as the numeral given.

1. 931 =
   A) 900 + 30 + 1
   B) 9 + 3 + 1
   C) 9 + 31
   D) 93 + 1

2. 660 =
   A) 600 + 60 + 0
   B) 6 + 6 + 0
   C) 66 + 0
   D) 60 + 60

3. 264 =
   A) 200 + 60 + 4
   B) 20 + 64
   C) 2 + 6 + 4
   D) 26 + 4

4. 640 =
   A) 64 + 0
   B) 6 + 4 + 0
   C) 60 + 40
   D) 600 + 40 + 0

5. 312 =
   A) 31 + 2
   B) 30 + 12
   C) 3 + 1 + 2
   D) 300 + 10 + 2

6. 826 =
   A) 8 + 2 + 6
   B) 800 + 20 + 6
   C) 82 + 6
   D) 8 + 26

7. 178 =
   A) 1 + 7 + 8
   B) 10 + 78
   C) 17 + 8
   D) 100 + 70 + 8

8. 509 =
   A) 50 + 9
   B) 5 + 9
   C) 500 + 0 + 9
   D) 5 + 0 + 9

d = 8.040

0390 Recognizing place value for two- or three-digit numerals and number words.

The learner will identify the two- or three-digit numeral and the numbers of the same value.

Directions: Give the correct answer.

1. **What digit is in the *one's* place in 23?**
   A) 2
   B) 3
   C) 0
   D) 1

2. **In the numeral 384, the 8 means**
   A) 8
   B) 80
   C) 800

3. **In the numeral 256, the 5 means**
   A) 5
   B) 50
   C) 500

4. **How many *tens* in 756?**
   A) 7
   B) 5
   C) 6
   D) 11

5. **In the numeral 137, the 7 means**
   A) 7
   B) 70
   C) 700

6. **How many *hundreds* in 924?**
   A) 9
   B) 2
   C) 4
   D) 90

7. **How many *hundreds* in 473?**
   A) 3
   B) 4
   C) 7
   D) 14

0400 Identifying multiplication equations for arrays.

The learner will identify multiplication equations for given arrays for products to 81.

Directions: Choose the answer that means the same as the grouping.

1.

A) 6 X 4
B) 6 X 1
C) 4 X 1
D) 1 X 6

000000
000000
000000
000000

2.

A) 1 X 8
B) 1 X 7
C) 7 X 1
D) 8 X 7

00000000
00000000
00000000
00000000
00000000
00000000
00000000

3.

A) 10 X 10
B) 1 X 1
C) 10 X 1
D) 1 X 0

0000000000

4.

A) 1 X 6
B) 1 X 5
C) 5 X 1
D) 6 X 5

000000
000000
000000
000000
000000

5.

A) 1 X 8
B) 8 X 1
C) 8 X 9
D) 1 X 9

000000000
000000000
000000000
000000000
000000000
000000000
000000000
000000000

6.

A) 1 X 5
B) 3 X 5
C) 1 X 3
D) 5 X 1

000
000
000
000
000

3

0410 Identifying families of facts.

Given products to 81, the learner will identify the 4-member family of facts for each product.

Directions: Select the answer that names the family of facts for the given product.

1. $\boxed{12}$

A) 7 X 2 = ____; 2 X 7 = ____; ____ ÷ 7 = 2; ____ ÷ 2 = 7
B) 4 X 3 = ____; 3 X 4 = ____; ____ ÷ 4 = 3; ____ ÷ 3 = 4
C) 8 X 2 = ____; 2 X 8 = ____; ____ ÷ 8 = 2; ____ ÷ 2 = 8
D) 9 X 2 = ____; 2 X 9 = ____; ____ ÷ 9 = 2; ____ ÷ 2 = 9

2. $\boxed{54}$

A) 6 X 8 = ____; 8 X 6 = ____; ____ ÷ 6 = 8; ____ ÷ 8 = 6
B) 9 X 6 = ____; 6 X 9 = ____; ____ ÷ 9 = 6; ____ ÷ 6 = 9
C) 7 X 6 = ____; 6 X 7 = ____; ____ ÷ 7 = 6; ____ ÷ 6 = 7
D) 7 X 7 = ____; ____ ÷ 7 = 7

3. $\boxed{32}$

A) 6 X 6 = ____; ____ ÷ 6 = 6
B) 7 X 5 = ____; 5 X 7 = ____; ____ ÷ 7 = 5; ____ ÷ 5 = 7
C) 6 X 5 = ____; 5 X 6 = ____; ____ ÷ 6 = 5; ____ ÷ 5 = 6
D) 8 X 4 = ____; 4 X 8 = ____; ____ ÷ 8 = 4; ____ ÷ 4 = 8

4. $\boxed{72}$

A) 9 X 9 = ____; ____ ÷ 9 = 9
B) 7 X 9 = ____; 9 X 7 = ____; ____ ÷ 9 = 7; ____ ÷ 7 = 9
C) 8 X 9 = ____; 9 X 8 = ____; ____ ÷ 8 = 9; ____ ÷ 9 = 8
D) 6 X 8 = ____; 8 X 6 = ____; ____ ÷ 8 = 6; ____ ÷ 6 = 8

0410 (continued)

5. $\boxed{21}$

A) 8 X 5 = ____; 5 X 8 = ____; ____ ÷ 8 = 5; ____ ÷ 5 = 8
B) 4 X 5 = ____; 5 X 4 = ____; ____ ÷ 4 = 5; ____ ÷ 5 = 4
C) 8 X 3 = ____; 3 X 8 = ____; ____ ÷ 8 = 3; ____ ÷ 3 = 8
D) 3 X 7 = ____; 7 X 3 = ____; ____ ÷ 7 = 3; ____ ÷ 3 = 7

6. $\boxed{48}$

A) 6 X 8 = ____; 8 X 6 = ____; ____ ÷ 8 = 6; ____ ÷ 6 = 8
B) 6 X 7 = ____; 7 X 6 = ____; ____ ÷ 6 = 7; ____ ÷ 7 = 6
C) 7 X 7 = ____; ____ ÷ 7 = 7
D) 9 X 5 = ____; 5 X 9 = ____; ____ ÷ 5 = 9; ____ ÷ 9 = 5

7. $\boxed{63}$

A) 8 X 8 = ____; ____ ÷ 8 = 8
B) 6 X 9 = ____; 9 X 6 = ____; ____ ÷ 9 = 6; ____ ÷ 6 = 9
C) 8 X 9 = ____; 9 X 8 = ____; ____ ÷ 9 = 8; ____ ÷ 8 = 9
D) 7 X 9 = ____; 9 X 7 = ____; ____ ÷ 9 = 7; ____ ÷ 7 = 9

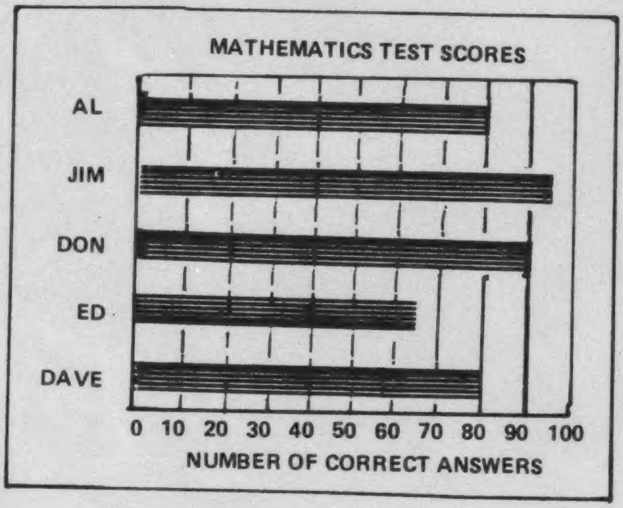
d = 8.270

0420 Reading bar graphs (answering questions after reading graph).

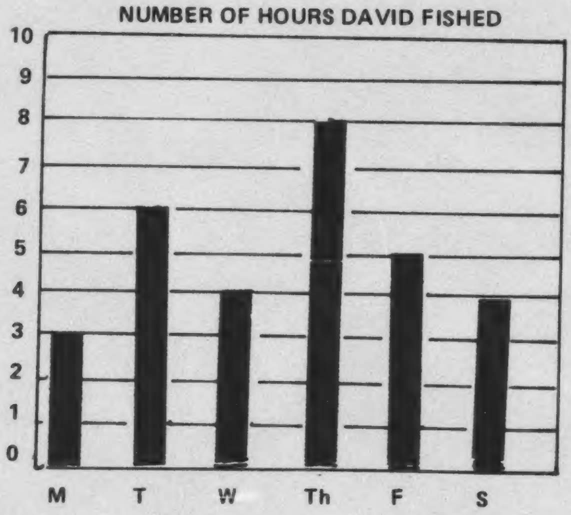
The learner will read a given bar graph to answer questions.

Directions: Select the correct answers to the problem by using the information in each bar graph.

1. $\boxed{?}$ **had the lowest score on the test.**
   - A) Ed
   - B) Al
   - C) Dave

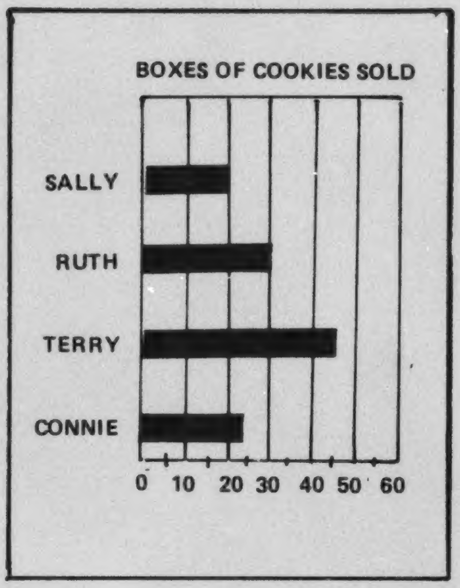


2. **On** $\boxed{?}$**, David fished for the longest amount of time.**
   - A) Mon.
   - B) Tues.
   - C) Thurs.

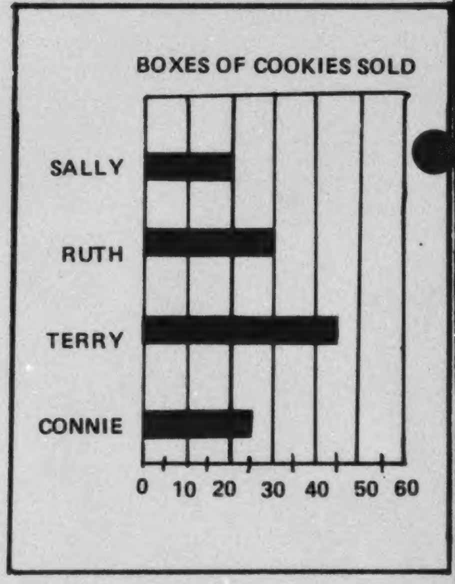


0420 (continued)

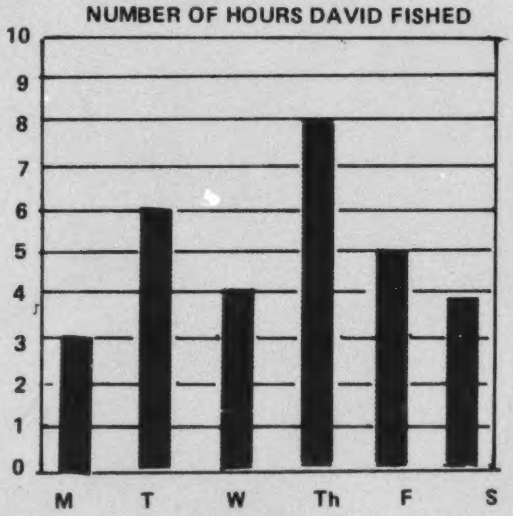
3. Connie sold $\boxed{?}$ boxes of cookies.
   - A) 20
   - B) 25
   - C) 30



4. $\boxed{?}$ sold the least number of cookies.
   - A) Sally
   - B) Ruth
   - C) Terry

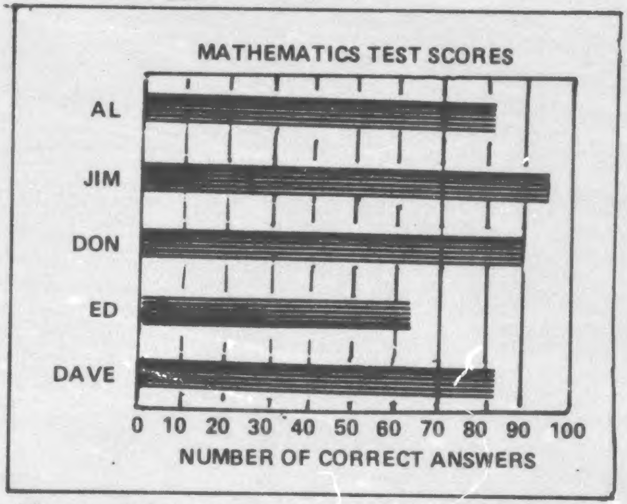


5. David fished $\boxed{?}$ more hours on Thursday than Wednesday.
   - A) 4
   - B) 5
   - C) 6

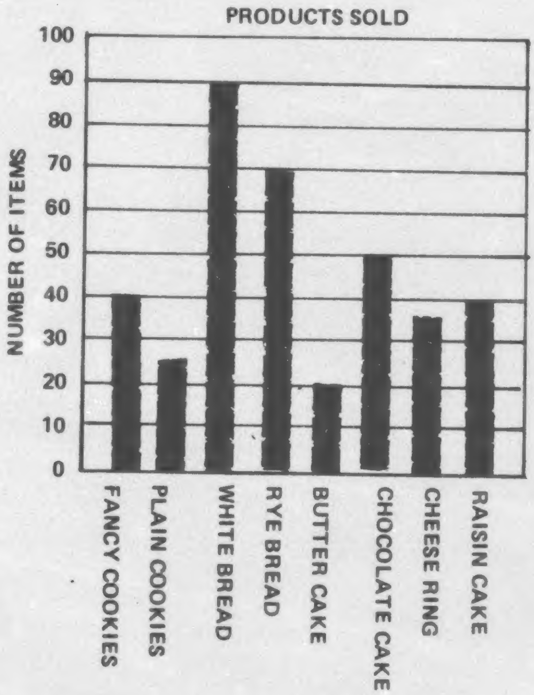


0420 (continued)

6. The highest score on the test was $\boxed{?}$.
   A) 90
   B) 95
   C) 100



7. $\boxed{?}$ more loaves of white bread than rye bread were sold.
   A) 30
   B) 10
   C) 20



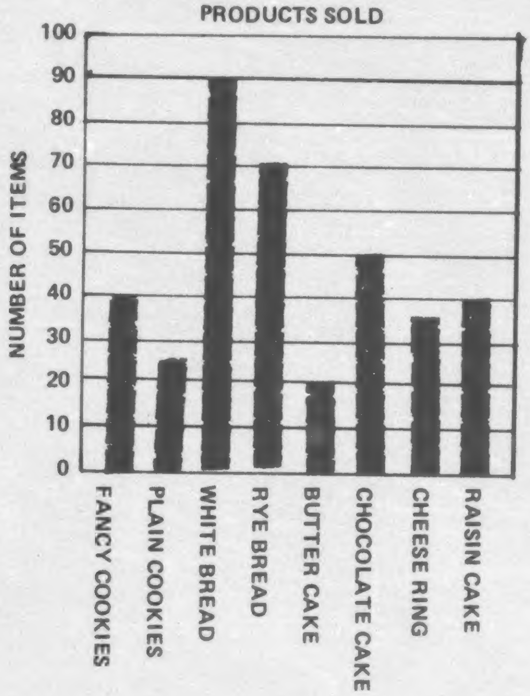
0420 (continued)

8. The total number of butter cakes, chocolate cakes, and raisin cakes sold is $\boxed{?}$.

A) 90

B) 110

C) 100



d = 8.285

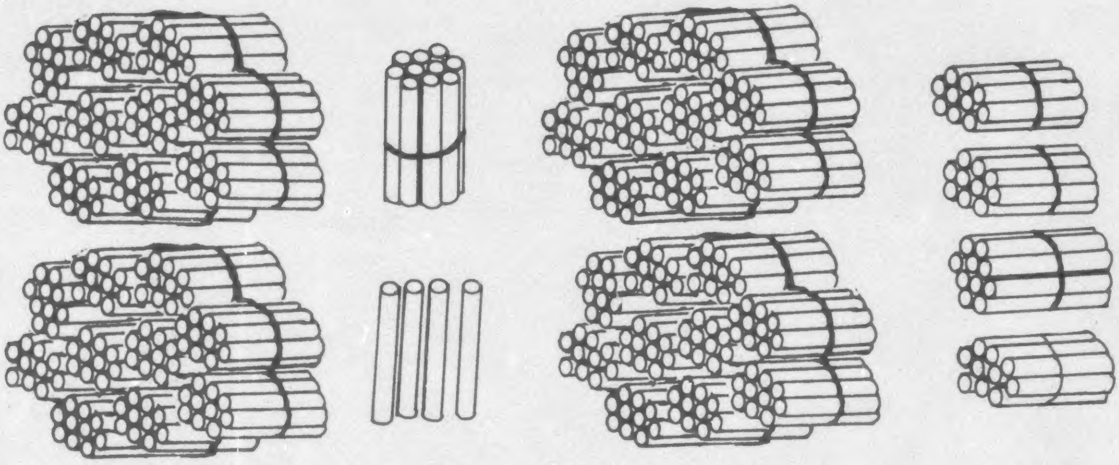
0430 Identifying three-digit numerals for objects grouped by tens and ones.

Given arrays or pictures of objects grouped by tens and ones, the learner will determine the three-digit numeral for each.

Directions: Choose the correct numeral for the picture given.

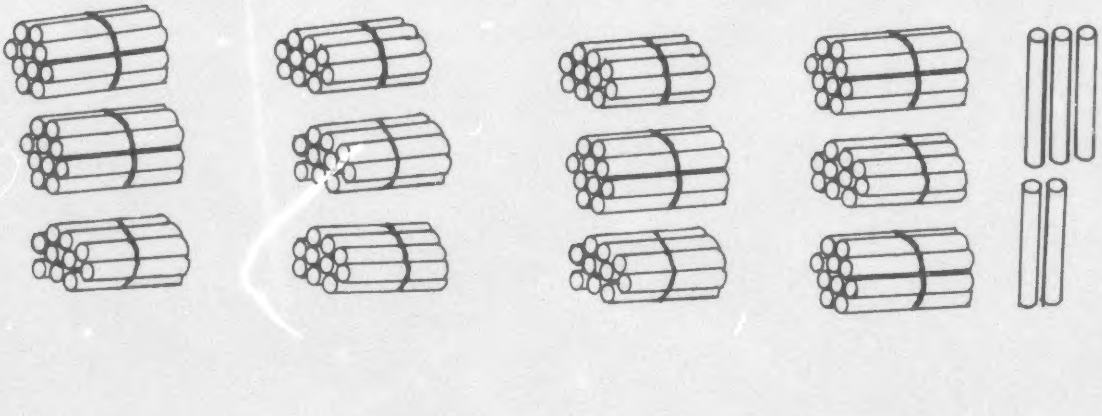
1.

A) 4054
B) 454
C) 4504



2.

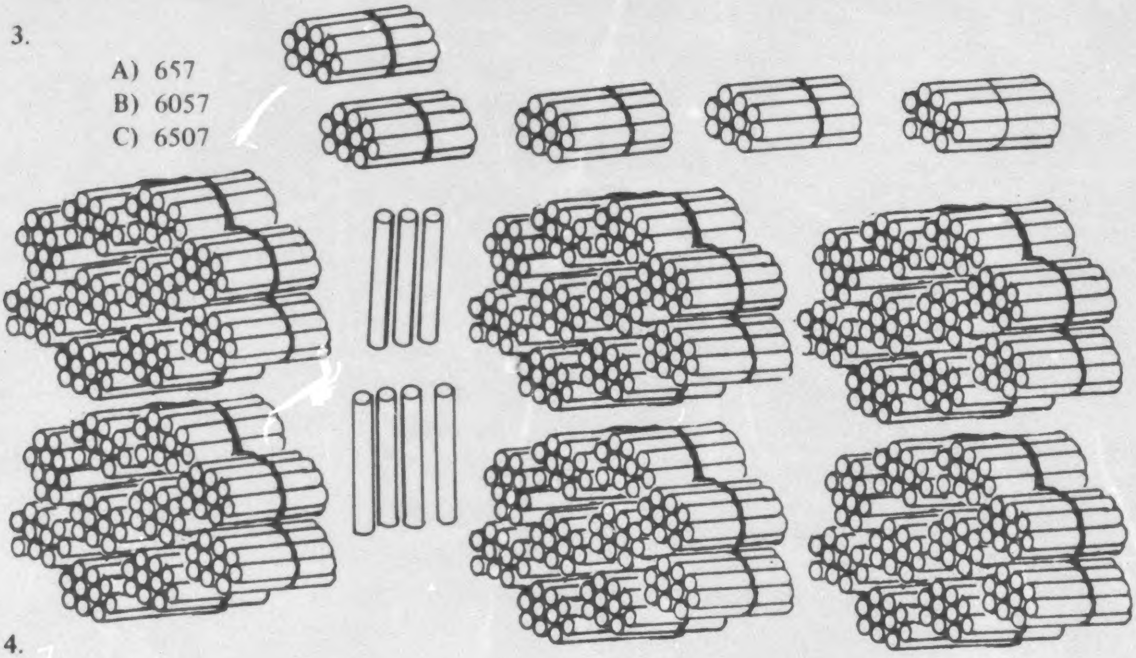
A) 512
B) 1205
C) 125
D) 1250



0430 (continued)

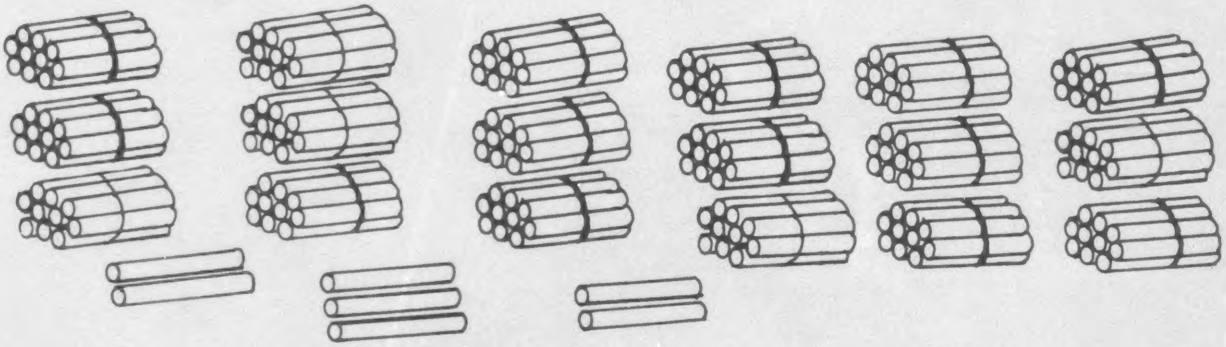
3.

A) 657
B) 6057
C) 6507



4.

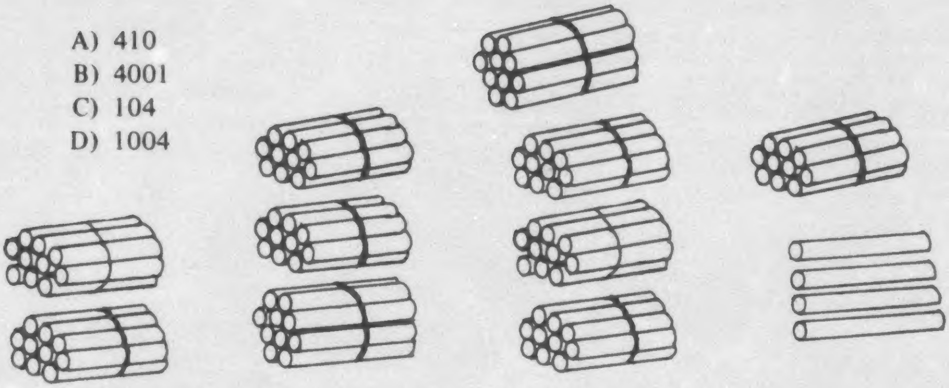
A) 718
B) 1807
C) 1087
D) 187



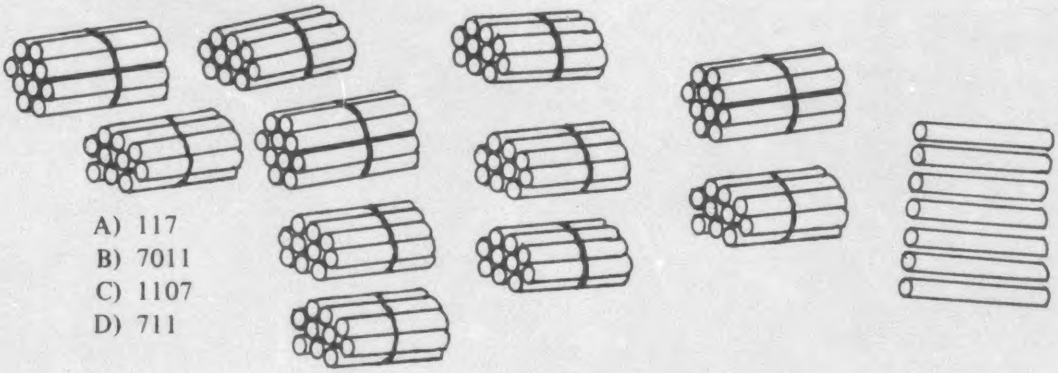
0430 (continued)

5.

A) 410
B) 4001
C) 104
D) 1004



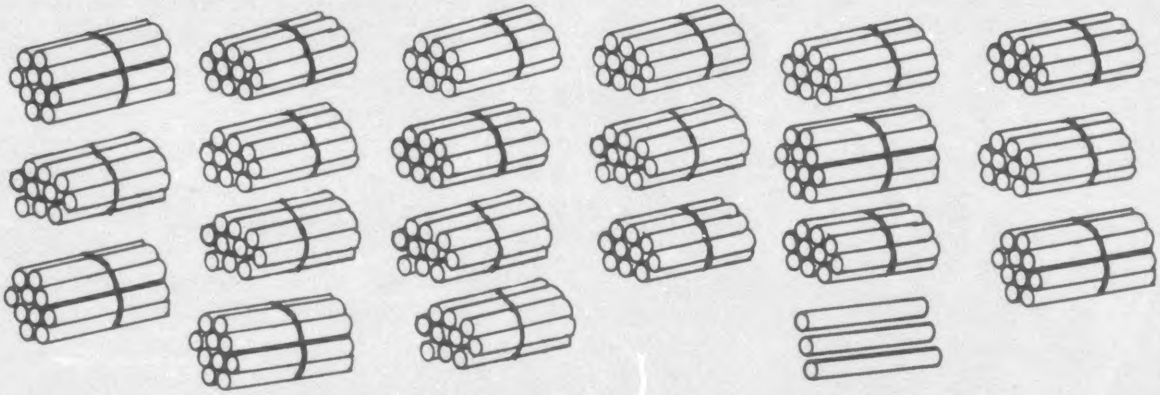
6. **Choose the 3-digit numeral for the given picture.**



A) 117
B) 7011
C) 1107
D) 711

7. **Choose the 3-digit numeral for the given picture.**

A) 2003
B) 203
C) 3200
D) 320



d = 8.440

0440 Adding with regrouping—two addends with four digits.

Given addition problems of two addends of four digits, requiring regrouping from ones to tens place and tens to hundreds place for solution, the learner will find the sums.

Directions: Select the correct answer for the problem.

1. 8729
+ 1195

A) 9814
B) 10814
C) 10824
D) 9924

2. 1293
+ 1248

A) 2541
B) 2431
C) 3531
D) 3431

3. 692
+ 498

A) 1080
B) 1190
C) 1090
D) 1180

4. 1677
+ 7245

A) 8812
B) 9812
C) 8922
D) 9922

5. 1493
+ 4477

A) 5860
B) 6970
C) 5970
D) 6970

6. 274
+ 178

A) 452
B) 342
C) 442
D) 352

7. 6325
+ 2736

A) 8051
B) 9161
C) 8151
D) 9061

8. 2524
+ 3386

A) 5800
B) 6910
C) 5910
D) 6800

d = 8.540

0450 Solving word problems requiring regrouping.

The learner will solve addition and subtraction word problems for two-digit numerals involving regrouping of tens and ones for solution.

Directions: Choose the answer that is correct for the problem.

1. **There were 98 dogs in the kennel on Friday and 15 more on Saturday. How many dogs were in the kennel on Saturday?**
   A) 1013
   B) 103
   C) 1113
   D) 113

2. **Sally brought 24 cookies to school for the party and Donna brought 36. How many cookies did both girls bring?**
   A) 50 cookies
   B) 60 cookies
   C) 12 cookies
   D) 510 cookies

3. **David had 14 pennies. Sue had 3 pennies. John had 95 pennies. How many pennies did they have altogether?**
   A) 1112 pennies
   B) 102 pennies
   C) 1012 pennies
   D) 112 pennies

4. **Mary had 53 crayons at home. She took 15 of them to school. Mary left how many crayons at home?**
   A) 42
   B) 48
   C) 68
   D) 38

5. **Pam took 75 cents to town. She spent 39 cents for a cutout book. How much money did she have left?**
   A) 44 cents
   B) 46 cents
   C) 36 cents
   D) 114 cents

0450 (continued)

6. **On Monday, Lee sold 66 newspapers. On Tuesday, he sold 47 newspapers. How many more papers did he sell on Monday than on Tuesday?**
   A) 29
   B) 21
   C) 19
   D) 11

7. **Jim had 36 marbles. Tom gave him some more. Now Jim has 82 marbles. How many marbles did Tom give to Jim?**
   A) 54
   B) 46
   C) 56
   D) 118

8. **There were 26 firemen at a fire. After others came to help them, there were 42 firemen at the fire. How many firemen came to help the 26?**
   A) 26
   B) 24
   C) 68
   D) 16

d = 8.820

0460 Using one-digit multipliers.

The learner will determine the products for one-digit multipliers and two-three-digit multiplicands.

Directions: Select the correct answer for the problem.

1. $\begin{array}{r} 184 \\ \times\ 9 \\ \hline \end{array}$

A) 1656
B) 926
C) 1626
D) 956

2. $\begin{array}{r} 32 \\ \times\ 2 \\ \hline \end{array}$

A) 34
B) 54
C) 64
D) 60

3. $\begin{array}{r} 117 \\ \times\ 6 \\ \hline \end{array}$

A) 662
B) 602
C) 762
D) 702

4. $\begin{array}{r} 235 \\ \times\ 7 \\ \hline \end{array}$

A) 1334
B) 1615
C) 1415
D) 1645

5. $\begin{array}{r} 146 \\ \times\ 3 \\ \hline \end{array}$

A) 328
B) 338
C) 438
D) 428

6. $\begin{array}{r} 835 \\ \times\ 7 \\ \hline \end{array}$

A) 5845
B) 5615
C) 5815
D) 5645

7. $\begin{array}{r} 279 \\ \times\ 8 \\ \hline \end{array}$

A) 2222
B) 2232
C) 1662
D) 1632

8. $\begin{array}{r} 382 \\ \times\ 9 \\ \hline \end{array}$

A) 3438
B) 2728
C) 3428
D) 2738

d = 8.860

0470 Identifying numerals to five digits for word numbers.

The learner will identify numerals to five digits for given word numbers.

Directions: Choose the answer that has the same value as the word number.

1. **three thousand one**
   A) 3010
   B) 3001
   C) 30010

2. **thirty four thousand six hundred eighty**
   A) 34680
   B) 346080
   C) 304680

3. **ten thousand one hundred one**
   A) 100101
   B) 10101
   C) 101001

4. **ten thousand, three hundred twelve**
   A) 1030012
   B) 130012
   C) 10312

5. **eight thousand forty six**
   A) 800040
   B) 8046
   C) 80046

6. **forty one thousand six hundred five**
   A) 4165
   B) 416005
   C) 41605

7. **seventy thousand two hundred thirty seven**
   A) 700237
   B) 7237
   C) 70237

8. **fifty one thousand eighty two**
   A) 51082
   B) 510082
   C) 5182

d = 8.920

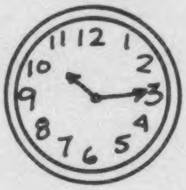
0480 Telling time to the quarter hour.

Given clock faces picturing time to quarter hours, the learner will identify the time shown on each.

Directions: Choose the answer that correctly names the time shown on the clock.

1\.

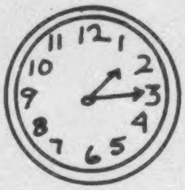
A) a quarter to 10
B) a quarter to 11
C) 10:15
D) 10 minutes to 3



11
12
1
2
10
9
3
4
8
7
6
5

2\.

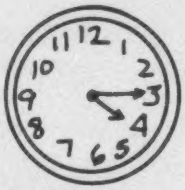
A) 10 minutes past 3
B) 50 minutes to 3
C) a quarter past 2
D) 3:10



11
12
1
2
10
9
3
4
8
7
6
5

3\.

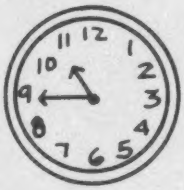
A) 4:15
B) a quarter to 4
C) 3:20
D) a quarter past 3



11
12
1
2
10
9
3
4
8
7
6
5

4\.

A) 15 minutes to 11
B) 5 minutes to 9
C) 45 minutes past 11
D) 9:55

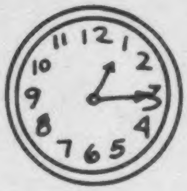


11
12
1
2
10
9
3
4
8
7
6
5

0480 (continued)

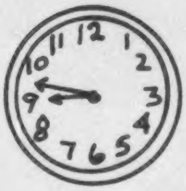
5.

A) 5 minutes past 3
B) quarter to two
C) 2:15
D) quarter past one


12
1
2
3
4
5
6
7
8
9
10
11

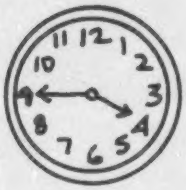
6.

A) quarter past 8
B) 45 minutes past nine
C) 9:45
D) 8:45


12
1
2
3
4
5
6
7
8
9
10
11

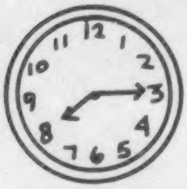
7.

A) 3:45
B) 9:20
C) a quarter past 3
D) 4:45


12
1
2
3
4
5
6
7
8
9
10
11

8.

A) twenty minutes to 3
B) quarter past 8
C) 3:40
D) 15 minutes to 9


12
1
2
3
4
5
6
7
8
9
10
11

d = 8.970

0490 Recognizing place value.

The learner will identify the value of a specific digit in a five- or six-digit numeral.

Directions: Select the answer that names the value of the underlined number.

1. 53,127
   - A) 7000
   - B) 7
   - C) 70
   - D) 700

2. How many hundred thousands in 468,921?
   - A) 4
   - B) 6
   - C) 8
   - D) 9

3. How many thousands in 16,438?
   - A) 1
   - B) 6
   - C) 4
   - D) 3

4. 17,235
   - A) 2
   - B) 20
   - C) 200
   - D) 2000

5. 56,031
   - A) six thousand
   - B) six hundred
   - C) sixty
   - D) six

6. 10,115
   - A) one
   - B) one thousand
   - C) ten thousand
   - D) ten

7. 12,345
   - A) 100
   - B) 1000
   - C) 10,000
   - D) 1

8. 82,017
   - A) eighty
   - B) eight thousand
   - C) eighty thousand
   - D) eight

d = 9.025

0500 Subtracting with regrouping–four digit numerals.

Given subtraction problems of four-digit numerals, requiring regrouping from tens to ones place and hundreds to tens place, learner will find the differences.

Directions: Select the correct answer for the problem.

1. $\begin{array}{r} 8431 \\ -6875 \\ \hline \end{array}$

A) 2656
B) 2406
C) 2444
D) 1556

2. $\begin{array}{r} 631 \\ -347 \\ \hline \end{array}$

A) 284
B) 294
C) 384
D) 394

3. $\begin{array}{r} 6478 \\ -1845 \\ \hline \end{array}$

A) 5623
B) 4523
C) 5433
D) 4633

4. $\begin{array}{r} 648 \\ -257 \\ \hline \end{array}$

A) 491
B) 411
C) 391
D) 905

5. $\begin{array}{r} 2591 \\ -1292 \\ \hline \end{array}$

A) 1301
B) 1299
C) 199
D) 1199

6. $\begin{array}{r} 6951 \\ -1657 \\ \hline \end{array}$

A) 5306
B) 5304
C) 4294
D) 5294

7. $\begin{array}{r} 6127 \\ -1069 \\ \hline \end{array}$

A) 5142
B) 5058
C) 4058
D) 5168

8. $\begin{array}{r} 475 \\ -386 \\ \hline \end{array}$

A) 89
B) 111
C) 189
D) 99

d = 9.390

0510 Adding with regrouping–five digit addends.

Given addition problems of five-digit addends, requiring regrouping for any or all of the places ones, tens, hundreds or thousands, the learner will find the sums.

Directions: Select the correct answer.

1. 64675
   2739
   + 4368

   A) 70662
   B) 72892
   C) 71782
   D) 74932

2. 65924
   37416
   +52598

   A) 155938
   B) 144828
   C) 145838
   D) 156038

3. 46972
   58346
   +72049

   A) 166357
   B) 177367
   C) 177267
   D) 166257

4. 82005
   98490
   +61207

   A) 231692
   B) 231602
   C) 242702
   D) 241702

5. 48723
   14956
   +72389

   A) 12458
   B) 136068
   C) 135968
   D) 135068

6. 63704
   49937
   +62488

   A) 164419
   B) 173028
   C) 176129
   D) 176029

7. 46801
   66627
   +96914

   A) 198332
   B) 209342
   C) 210342
   D) 210352

d = 9.405

0520 Subtracting with zeros and regrouping.

Given subtraction problems of three-digit numerals (with zeros in the ten's place and/or one's place of the minuend) the learner will find the differences.

Directions: Select the correct answer for the problem.

1. 600
−127

A) 473
B) 527
C) 583
D) 573

2. 500
−235

A) 335
B) 375
C) 265
D) 365

3. 8006
−5988

A) 2122
B) 2018
C) 3988
D) 2028

4. 900
−624

A) 324
B) 386
C) 376
D) 276

5. 903
−175

A) 828
B) 728
C) 872
D) 838

6. 800
−681

A) 219
B) 281
C) 119
D) 229

7. 302
−135

A) 267
B) 233
C) 277
D) 167

8. 501
−142

A) 359
B) 441
C) 469
D) 459

d = 9.625

0530 Recognizing fractional parts of geometric figures.

The learner will identify the fraction for the shaded part of a figure. The figures may be divided into from two to ten parts.

Directions: Name the *shaded part* of the picture with a fraction.

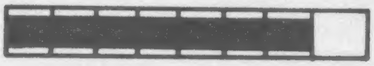
1.

A) $\frac{8}{7}$

B) $\frac{7}{7}$

C) $\frac{1}{8}$

D) $\frac{7}{8}$



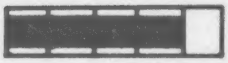
2.

A) $\frac{1}{5}$

B) $\frac{4}{4}$

C) $\frac{4}{5}$

D) $\frac{5}{4}$



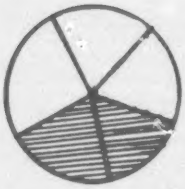
3.

A) $\frac{5}{2}$

B) $\frac{2}{2}$

C) $\frac{3}{5}$

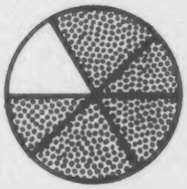
D) $\frac{2}{5}$



0530 (continued)

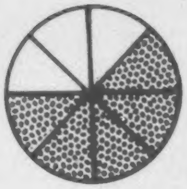
4.

A) $\frac{5}{6}$
B) $\frac{5}{5}$
C) $\frac{6}{5}$
D) $\frac{1}{6}$



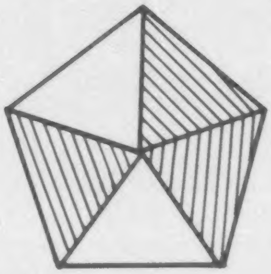
5.

A) $\frac{3}{5}$
B) $\frac{5}{5}$
C) $\frac{5}{8}$
D) $\frac{8}{5}$



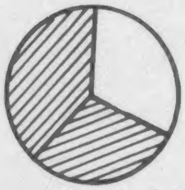
6.

A) $\frac{3}{4}$
B) $\frac{2}{3}$
C) $\frac{5}{3}$
D) $\frac{3}{5}$



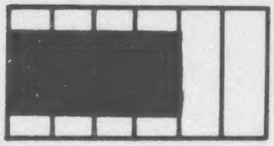
7.

A) $\frac{3}{2}$
B) $\frac{2}{3}$
C) $\frac{2}{2}$
D) $\frac{1}{3}$



8.

A) $\frac{6}{4}$
B) $\frac{4}{4}$
C) $\frac{2}{6}$
D) $\frac{4}{6}$



d = 9.635

0540 Dividing by one-digit divisor with remainders.

The learner can determine the quotient with remainder for three-digit dividends.

Directions: Select the correct answer to the following problems.

1. $9\overline{)379}$
   A) 4 r 21
   B) 42
   C) 42 r 1
   D) 40 r 21

2. $7\overline{)457}$
   A) 65 r 2
   B) 60 r 52
   C) 6 r 52
   D) 65

3. $9\overline{)266}$
   A) 20 r 95
   B) 2 r 95
   C) 29 r 5
   D) 290 r 5

4. $3\overline{)668}$
   A) 222 r 2
   B) 22 r 22
   C) 2 r 222
   D) 200 r 222

5. $7\overline{)459}$
   A) 60 r 54
   B) 65
   C) 6 r 54
   D) 65 r 4

6. $5\overline{)268}$
   A) 5 r 33
   B) 50 r 33
   C) 530 r 3
   D) 53 r 3

7. $8\overline{)2461}$
   A) 316 r 5
   B) 307 r 5
   C) 407 r 5
   D) 460 r 5

8. $5\overline{)4386}$
   A) 817 r 1
   B) 877 r 1
   C) 868 r 9
   D) 870 r 3

d = 9.670

0550 Multiplying by tens.

The learner can determine the products for multiplier having a factor of ten and one-three digit multiplicands.

Directions: Select the correct answer for the problem.

1. 93
×50

A) 4650
B) 465
C) 558

2. 731
× 30

A) 2193
B) 21930
C) 21931

3. 207
× 20

A) 414
B) 540
C) 4140

4. 717
× 70

A) 497490
B) 50190
C) 5019

5. 60
×10

A) 6
B) 60
C) 600
D) 6000

6. 703
× 50

A) 35150
B) 365
C) 3650

7. 700
× 40

A) 280
B) 2800
C) 28000

8. 238
×100

A) 2380
B) 23800
C) 238000
D) 2380000

d = 9.670

0560 Reading bar graphs and picture graphs.

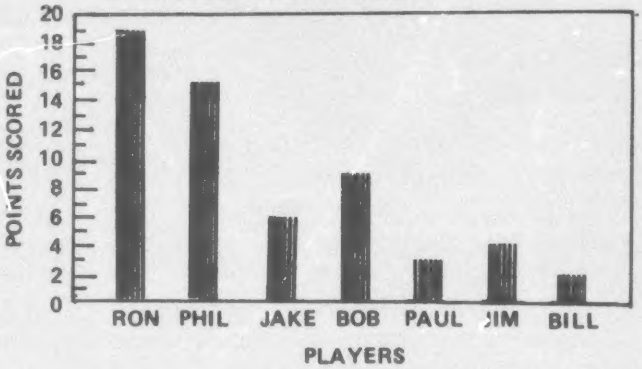
The learner will determine whether a given bar graph or picture graph of at least five categories accurately illustrates raw data given.

Questions 1 and 2 refer to the graph below.

1. **How many points did Bill score?**
   A) 2 points
   B) 4 points
   C) 6 points
   D) 8 points

2. **How many points did Jake score?**
   A) 2 points
   B) 4 points
   C) 6 points
   D) 8 points

SCORING RECORD OF LAST WEEK'S BASKETBALL GAME

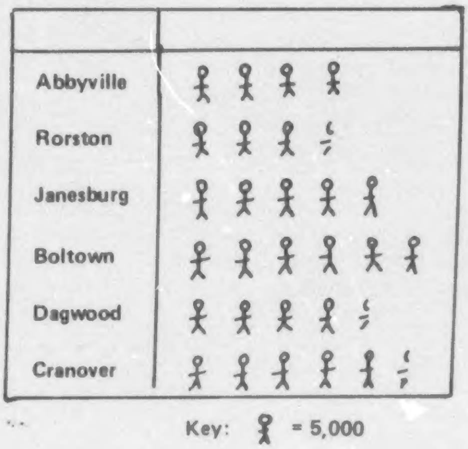


Questions 3 and 4 refer to the graph below.

3. **What is the population of Abbyville?**
   A) $4\frac{1}{2}$
   B) 50,000
   C) 20,000
   D) 22,500

4. **What is the population of Dagwood?**
   A) $4\frac{1}{2}$
   B) 50,000
   C) 20,000
   D) 22,500

APPROXIMATE POPULATION OF 6 CITIES



d = 9.715

0570 Multiplying with two-digit multipliers.

The learner will determine the products for one-two-digit multipliers and one-three-digit multiplicands. Multipliers and multiplicands will have zeros appearing at random in the ones and tens places of two- and three-digit numerals.

Directions: Select the correct answer for the problem.

1. 700
× 29

A) 7700
B) 20300
C) 20030

2. 500
× 27

A) 1350
B) 4500
C) 13500

3. 370
× 29

A) 10730
B) 4070
C) 1073

4. 960
× 26

A) 24960
B) 1496
C) 7680

5. 808
× 65

A) 8888
B) 52520
C) 5240

6. 417
× 45

A) 18765
B) 3753
C) 18665

7. 486
× 27

A) 13222
B) 13122
C) 4374

8. 683
× 39

A) 8196
B) 26637
C) 26537

d = 10.055

0580 Subtracting with regrouping–4 or 5 digit numerals.

Given subtraction problems of 4 or 5 digit numerals requiring regrouping from any or all of the places, tens, hundreds or thousands, the learner will find the differences.

Directions: Select the correct answer for the problem.

1. 79341
− 1843

A) 77498
B) 78502
C) 78508
D) 78518

2. 12364
− 2473

A) 10119
B) 10991
C) 10191
D) 9891

3. 76813
− 4923

A) 72110
B) 72990
C) 71890
D) 61890

4. 12052
− 6730

A) 6678
B) 6322
C) 5312
D) 5322

5. 70058
−18988

A) 68930
B) 61170
C) 60070
D) 51070

6. 14974
− 9986

A) 4988
B) 15012
C) 14988
D) 5098

7. 71834
−71785

A) 10151
B) 10049
C) 49
D) 151

8. 60407
−59877

A) 530
B) 1530
C) 19470
D) 11630

d = 10.090

0590 Using one-digit divisors.

The learner will determine the quotient for one-digit divisors and one-three-digit dividends. There will be no remainder in the quotients.

Directions: Select the correct answer for the problem.

1. $8\overline{)160}$
   A) 19
   B) 20
   C) 2
   D) 10

2. $3\overline{)45}$
   A) 11
   B) 12
   C) 15
   D) 13

3. $9\overline{)297}$
   A) 33
   B) 32
   C) 30
   D) 23

4. $7\overline{)112}$
   A) 14
   B) 16
   C) 15
   D) 12

5. $3\overline{)216}$
   A) 72
   B) 75
   C) 62
   D) 65

6. $6\overline{)108}$
   A) 17
   B) 6
   C) 18
   D) 20

7. $3\overline{)69}$
   A) 32
   B) 22
   C) 33
   D) 23

8. $8\overline{)672}$
   A) 80
   B) 82
   C) 62
   D) 84

d = 10.695

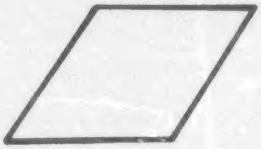
0600 Identifying angles and geometric figures.

Given illustrations, the learner will identify: right, obtuse, or acute angles, and other geometric figures.

Directions: Name the shapes.

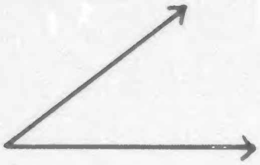
1.

A) parallelogram
B) trapezoid
C) octagon
D) pentagon



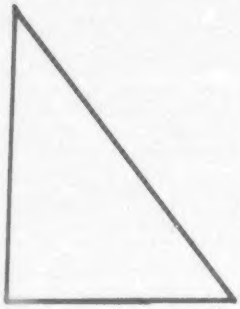
2.

A) right angle
B) obtuse angle
C) acute angle



3.

A) right triangle
B) equilateral triangle
C) isosceles triangle



d = 10.785

0610 Adding and subtracting like fractions.

The learner will determine the sums and differences for addition and subtraction problems of fractions having like denominators.

Directions: Select the correct answer.

1. $\frac{14}{15} - \frac{10}{15} =$

   A) $\frac{4}{15}$

   B) $\frac{24}{30}$

   C) $\frac{4}{30}$

   D) none of the above

2. $\frac{10}{15} - \frac{5}{15} =$

   A) $\frac{15}{15}$

   B) $\frac{5}{15}$

   C) $\frac{5}{30}$

   D) $\frac{15}{30}$

3. $\frac{4}{5} - \frac{3}{5} =$

   A) $\frac{1}{5}$

   B) $\frac{7}{5}$

   C) $\frac{1}{10}$

   D) none of the above

4. $\frac{4}{5} + \frac{4}{5} =$

   A) $\frac{4}{10}$

   B) $\frac{8}{10}$

   C) $\frac{8}{5}$

   D) none of the above.

5. $\frac{1}{3} + \frac{1}{3} =$

   A) $\frac{2}{6}$

   B) $\frac{2}{3}$

   C) $\frac{1}{6}$

   D) none of the above

6. $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5} =$

   A) $\frac{1}{20}$

   B) $\frac{4}{20}$

   C) $\frac{4}{5}$

   D) none of the above

0610 (continued)

7. $\frac{2}{6} + \frac{3}{6} =$

   A) $\frac{5}{12}$

   B) $\frac{6}{6}$

   C) $\frac{5}{6}$

   D) none of the above

8. $\frac{1}{9} + \frac{3}{9} + \frac{1}{9} =$

   A) $\frac{5}{18}$

   B) $\frac{5}{9}$

   C) $\frac{5}{27}$

   D) none of the above

0620 Using knowledge of money.

The learner will identify the coins required to make up a given amount of money of value less than one dollar, using as few coins as possible.

Directions: Choose the answer that matches the value of the money names below and *uses the fewest coins possible.*

1. **85 cents**
   - A) 1 quarter, 3 dimes
   - B) 3 quarters, 1 dime
   - C) 8 dimes, 5 pennies
   - D) 8 dimes, 1 nickel

2. **44 cents**
   - A) 1 quarter, 2 dimes, 4 pennies
   - B) 8 nickels, 4 pennies
   - C) 4 dimes, 4 pennies
   - D) 44 pennies

3. **35 cents**
   - A) 3 dimes, 1 nickel
   - B) 1 quarter, 1 dime
   - C) 3 dimes, 5 pennies
   - D) 7 nickels

4. **97 cents**
   - A) 3 quarters, 1 dime, 2 nickels, 2 pennies
   - B) 3 quarters, 2 dimes, 2 pennies
   - C) 2 quarters, 1 nickel, 2 pennies
   - D) 97 pennies

5. **53 cents**
   - A) 5 dimes, 3 pennies
   - B) 1 quarter, 3 pennies
   - C) 2 quarters, 3 pennies
   - D) 53 pennies

6. **48 cents**
   - A) 4 dimes, 1 nickel, 3 pennies
   - B) 9 nickels, 3 pennies
   - C) 1 quarter, 2 dimes, 3 pennies
   - D) 4 dimes, 8 pennies

7. **92 cents**
   - A) 9 dimes, 2 pennies
   - B) 3 quarters, 1 dime, 1 nickel, 2 pennies
   - C) 2 quarters, 1 dime, 2 pennies
   - D) 92 pennies

d = 10.845

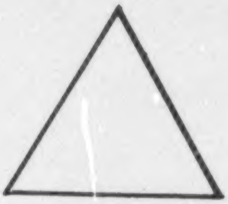
0630 Identifying polygons.

Given a drawing or a description of any polygon with not more than four sides, the learner will identify the polygon. The given polygons will include the triangle, square, rectangle, and quadrilateral.

Directions: Name the shapes.

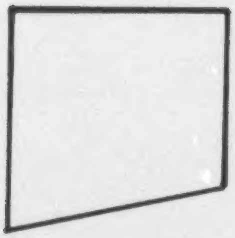
1.

A) triangle
B) square
C) rectangle
D) quadrilateral



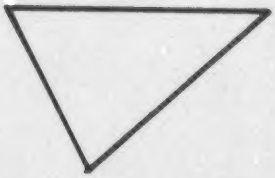
2.

A) triangle
B) square
C) rectangle
D) quadrilateral



3.

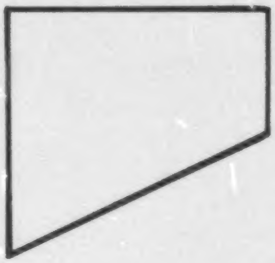
A) quadrilateral
B) triangle
C) rectangle
D) square

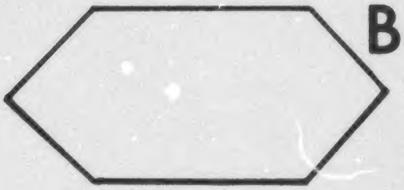


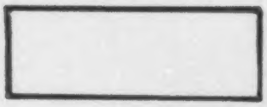
0630 (continued)

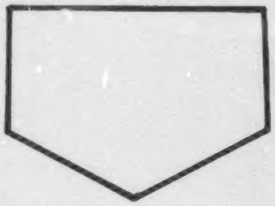
4. **Which figure is the rectangle?**

A) ______
B) ______
C) ______
D) ______


A


B


C


D

Directions: Find the correct definition for the term.

5. TRIANGLE

A) rectangle with all sides equal
B) quadrilateral with all sides equal
C) polygon composed of four line segments
D) polygon composed of three line segments

6. RECTANGLE

A) polygon composed of three line segments
B) quadrilateral with only three sides the same
C) quadrilateral with all right angles
D) polygon with at least five equal sides

0630 (continued)

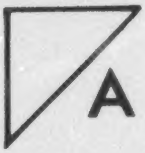
7. **Which figure is the quadrilateral?**

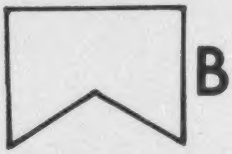
A) ______

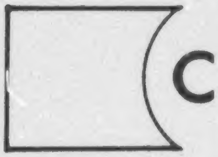
B) ______

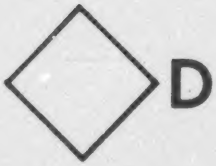
C) ______

D) ______









Directions: Find the correct definition for the term.

8. **QUADRILATERAL**

A) polygon with four sides

B) polygon with five sides

C) polygon with three sides

D) polygon with six sides

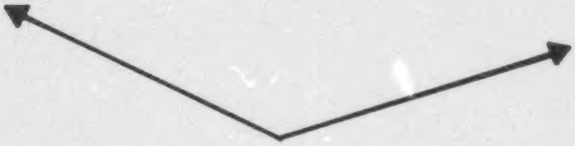
d = 10.955

0640 Recognizing right angles.

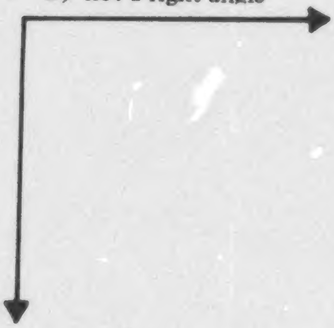
Given a selection of angles, the learner can identify the right angles.

Directions: Select the answer that is correct for the drawing.

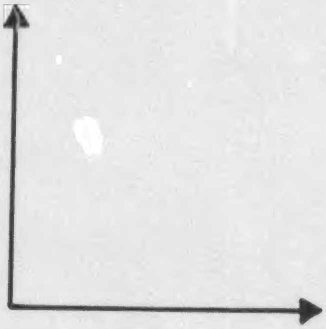
1.
A) right angle
B) not a right angle



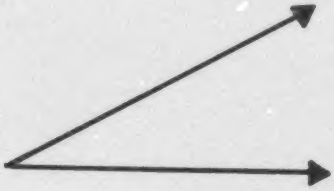
2.
A) right angle
B) not a right angle



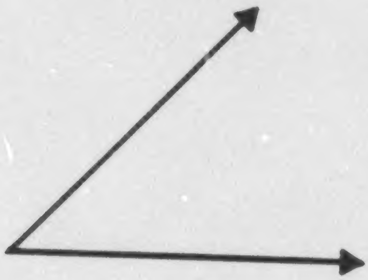
3.
A) right angle
B) not a right angle



4.
A) right angle
B) not a right angle



5.
A) right angle
B) not a right angle



0650 Identifying numerators and denominators.

Given fractions, the learner will identify the numerators or denominators as directed.

Directions: Select the correct answer.

1. $\frac{2}{3}$

   A) 2 is the denominator
   B) 3 is the numerator
   C) 2 is the numerator
   D) none of the above

2. $\frac{7}{10}$

   A) 7 is the numerator
   B) 10 is the numerator
   C) 7 is the denominator
   D) none of the above

3. $\frac{1}{4}$

   A) 1 is the denominator
   B) 1 is the numerator
   C) 4 is the numerator
   D) none of the above

4. $\frac{2}{7}$

   A) 7 is the numerator
   B) 7 is the denominator
   C) 2 is the denominator
   D) none of the above

5. $\frac{3}{4}$

   A) 3 is the denominator
   B) 3 is the numerator
   C) 4 is the numerator
   D) none of the above

6. $\frac{5}{9}$

   A) 5 is the denominator
   B) 9 is the numerator
   C) 9 is the denominator
   D) none of the above

7. $\frac{1}{2}$

   A) 2 is the numerator
   B) 1 is the denominator
   C) 1 is the numerator
   D) none of the above

8. $\frac{1}{5}$

   A) 5 is the denominator
   B) 5 is the numerator
   C) 1 is the denominator
   D) none of the above

d = 11.195

0660 Dividing by two-digit divisors.

The learner can determine the quotient for three-four-digit dividends and two-digit divisors.

Directions: Select the correct answer to the problem.

1. $32\overline{)997}$
   A) 31 r 5
   B) 301 r 5
   C) 33 r 5
   D) 303 r 5

2. $82\overline{)3363}$
   A) 401
   B) 410
   C) 41 r 1
   D) 400 r 1

3. $30\overline{)4562}$
   A) 118 r 2
   B) 141 r 2
   C) 152 r 2
   D) 153 r 2

4. $44\overline{)3596}$
   A) 90 r 2
   B) 80 r 42
   C) 81 r 42
   D) 81 r 32

5. $28\overline{)2963}$
   A) 15 r 23
   B) 151 r 5
   C) 102 r 7
   D) 105 r 23

6. $36\overline{)4804}$
   A) 133 r 16
   B) 140 r 4
   C) 132 r 34
   D) 143 r 6

7. $49\overline{)5749}$
   A) 101
   B) 117 r 16
   C) 118 r 7
   D) 120 r 9

d = 11.270

0670 Adding and subtracting fractions, mixed numbers and/or whole numbers.

The learner will determine sums and differences in lowest terms for fractional problems with no regrouping. Problems include fractions and mixed numbers with unlike denominators (less than 10) and/or whole numbers.

Directions: Select the correct answer to the problem.

1. $4\frac{3}{4} - 2\frac{2}{4} =$

A) $2\frac{1}{8}$

B) $2\frac{5}{4}$

C) $2\frac{5}{8}$

D) $2\frac{1}{4}$

2. $6\frac{3}{8} + 2\frac{2}{8} =$

A) $8\frac{5}{16}$

B) $4\frac{1}{8}$

C) $8\frac{5}{8}$

D) $4\frac{1}{16}$

d = 11.335

0680 Dividing with dividends and divisors having zeros.

Given division problems of three-four-digit dividends and two-digit divisors, both having randomly placed zeros, the learner will determine the quotients. Some of the quotients will have remainders.

Directions: Find the quotients of the two numbers.

1. $34\overline{)506}$
A) 13 r 34
B) 14 r 30
C) 11 r 32
D) 20 r 26

2. $50\overline{)7080}$
A) 120
B) 11 r 4
C) 141 r 30
D) 11 r 20

3. $8\overline{)60296}$
A) 75370
B) 8787
C) 7438
D) 7537

4. $34\overline{)560}$
A) 16 r 16
B) 10 r 20
C) 22 r 12
D) 15 r 50

5. $56\overline{)340}$
A) 7 r 42
B) 6 r 6
C) 6 r 4
D) 5 r 60

6. $40\overline{)5080}$
A) 127
B) 12 r 28
C) 132
D) 12

7. $46\overline{)7008}$
A) 113 r 10
B) 152 r 16
C) 150 r 18
D) 111 r 22

d = 11.485

0690 Expressing fractions in simplest terms.

Given a fraction having no greater than two-digits, the learner will express it in simplest terms.

Directions: Express the fraction in simplest form.

1. $\frac{9}{15} =$

A) $\frac{2}{3}$

B) $\frac{3}{5}$

C) $\frac{3}{10}$

D) $\frac{3}{4}$

2. $\frac{25}{30} =$

A) $\frac{5}{6}$

B) $\frac{5}{15}$

C) $\frac{4}{5}$

D) $\frac{5}{30}$

3. $\frac{6}{20} =$

A) $\frac{3}{10}$

B) $\frac{2}{5}$

C) $\frac{1}{4}$

D) $\frac{2}{10}$

4. $\frac{4}{16} =$

A) $\frac{2}{8}$

B) $\frac{1}{4}$

C) $\frac{8}{32}$

D) $\frac{1}{16}$

0690 (continued)

5. $\frac{8}{10} =$

A) $\frac{2}{3}$

B) $\frac{4}{5}$

C) $\frac{2}{5}$

D) $\frac{1}{5}$

6. $\frac{16}{32} =$

A) $\frac{1}{4}$

B) $\frac{8}{16}$

C) $\frac{4}{8}$

D) $\frac{1}{2}$

7. $\frac{4}{16} =$

A) $\frac{1}{4}$

B) $\frac{1}{8}$

C) $\frac{4}{8}$

D) $\frac{2}{8}$

8. $\frac{12}{18} =$

A) $\frac{4}{9}$

B) $\frac{3}{6}$

C) $\frac{4}{6}$

D) $\frac{2}{3}$

d = 11.495

0700 Identifying the least common multiple.

The learner will identify the least common multiple for sets of two or three whole numbers.

Directions: Select the least common multiple of the pair of numbers.

1. 3, 5
   - A) 12
   - B) 30
   - C) 15
   - D) 9

2. 3, 4
   - A) 9
   - B) 12
   - C) 24
   - D) 16

3. 5, 6
   - A) 15
   - B) 40
   - C) 60
   - D) 30

4. 4, 5
   - A) 10
   - B) 20
   - C) 30
   - D) 40

5. 1, 2, 3
   - A) 2
   - B) 4
   - C) 6
   - D) 8

6. 2, 3, 4
   - A) 12
   - B) 24
   - C) 16
   - D) 48

7. 9, 6
   - A) 36
   - B) 48
   - C) 12
   - D) 18

8. 4, 6, 8
   - A) 48
   - B) 12
   - C) 16
   - D) 24

d = 11.570

0710 Rounding

Given a list of whole numbers, each containing from 1 to 7 digits, the learner can round each number to any place value, as directed.

Directions: Round the number to the place value named:

1. **386 rounded to the nearest 10 is**

   A) 387
   B) 380
   C) 385
   D) 390
   E) 400

2. **87643 rounded to the nearest 100 is**

   A) 87600
   B) 90000
   C) 87645
   D) 88000
   E) 87500

3. **676454 rounded to the nearest 10 is**

   A) 676455
   B) 676460
   C) 676500
   D) 676400
   E) 676450

4. **3676499 rounded to the nearest million is**

   A) 3700000
   B) 3680000
   C) 4676499
   D) 3000000
   E) 4000000

5. **59364 rounded to the nearest 1000 is**

   A) 59400
   B) 60000
   C) 60364
   D) 59000
   E) 60400

d = 11.575

0720 Identifying equivalent fractions.

The learner will identify equivalent fractions for any given fraction.

Directions: Select the answer that has the same value as the fraction.

1. $\frac{4}{6} =$

A) $\frac{7}{4}$

B) $\frac{8}{3}$

C) $\frac{8}{12}$

D) $\frac{8}{9}$

2. $\frac{3}{4} =$

A) $\frac{3}{2}$

B) $\frac{3}{8}$

C) $\frac{6}{8}$

D) $\frac{9}{4}$

3. $\frac{2}{4} =$

A) $\frac{1}{2}$

B) $\frac{2}{8}$

C) $\frac{8}{12}$

D) $\frac{6}{8}$

4. $\frac{6}{7} =$

A) $\frac{3}{21}$

B) $\frac{18}{21}$

C) $\frac{12}{35}$

D) $\frac{7}{42}$

0720 (continued)

5. $\frac{3}{8} =$

A) $\frac{6}{8}$

B) $\frac{8}{24}$

C) $\frac{6}{16}$

D) $\frac{9}{16}$

6. $\frac{6}{9} =$

A) $\frac{1}{3}$

B) $\frac{9}{18}$

C) $\frac{2}{6}$

D) $\frac{2}{3}$

7. $\frac{12}{15} =$

A) $\frac{3}{5}$

B) $\frac{6}{3}$

C) $\frac{4}{3}$

D) $\frac{4}{5}$

8. $\frac{1}{4} =$

A) $\frac{4}{8}$

B) $\frac{6}{24}$

C) $\frac{8}{12}$

D) $\frac{4}{12}$

d = 11.710

0730 Identifying the least common denominator.

The learner will identify the least common denominator for sets of two or three fractions.

Directions: Select the least common denominator for the fractions.

1. $\boxed{\frac{2}{3}, \frac{3}{4}}$

A) 3
B) 4
C) 7
D) 12

2. $\boxed{\frac{3}{4}, \frac{4}{5}}$

A) 4
B) 5
C) 40
D) 20

3. $\boxed{\frac{2}{6}, \frac{4}{7}}$

A) 21
B) 42
C) 7
D) 6

4. $\boxed{\frac{7}{8}, \frac{2}{5}}$

A) 20
B) 40
C) 60
D) 80

5. $\boxed{\frac{2}{3}, \frac{3}{4}, \frac{4}{6}}$

A) 36
B) 12
C) 9
D) 24

6. $\boxed{\frac{2}{5}, \frac{1}{10}}$

A) 5
B) 10
C) 15
D) 20

7. $\boxed{\frac{4}{10}, \frac{3}{100}}$

A) 10
B) 100
C) 110
D) 1000

8. $\boxed{\frac{2}{3}, \frac{7}{9}}$

A) 3
B) 6
C) 9
D) 18

d = 11.750

0740 Multiplying whole numbers and decimal fractions.

The learner will determine the product for multiplication of a whole number less than 10,000 and a decimal fraction not to exceed three digits.

Directions: Select the product for the problem.

1. 345 X .423 =
   - A) .145935
   - B) 145.935
   - C) 145935
   - D) 14.5935

2. 5431 X .52 =
   - A) .282412
   - B) 2824.12
   - C) 282412
   - D) 28.2412

3. 345 X .45 =
   - A) 155.25
   - B) 15525
   - C) 15.525
   - D) .15525

4. 4.315 X 23 =
   - A) 99245
   - B) .099245
   - C) 9.9245
   - D) 99.245

5. 452 X .234 =
   - A) 105.768
   - B) 1057.68
   - C) .105768
   - D) 105768

6. .431 X 513 =
   - A) 221103
   - B) 2211.03
   - C) .221103
   - D) 221.103

7. .251 X 53 =
   - A) 133.03
   - B) .13303
   - C) 13.303
   - D) 13303

8. .451 X 35 =
   - A) 157.85
   - B) .15785
   - C) 15.785
   - D) 15785

d = 11.840

0750 Comparing integers.

Given an integer, the learner will recognize whether the integer is less than, equal to, or greater than another given integer.

Directions: For each of the following statements choose the symbol (<, =, >) that belongs in the blank so that the statement is true.

1. $3 \boxed{?} 1$
   A) <
   B) =
   C) >

2. $3 \boxed{?} 0$
   A) <
   B) =
   C) >

3. $\frac{4}{1} \boxed{?} 4$
   A) <
   B) =
   C) >

4. $-\frac{1}{2} \boxed{?} -0.5$
   A) <
   B) =
   C) >

5. $7 \boxed{?} 7.1$
   A) <
   B) =
   C) >

6. $\frac{3}{1} \boxed{?} -3$
   A) <
   B) =
   C) >

7. $6.9 \boxed{?} 6\frac{1}{2}$
   A) <
   B) =
   C) >

d = 11.950

0760 Adding decimals.

The learners will add decimals through the thousandths place.

Directions: Find the sums for the two numbers.

1. .53 + 4.5 =
   A) .96
   B) 5.03
   C) 9.6
   D) 48.3

2. 3.2 + .49 =
   A) 3.69
   B) 8.1
   C) .81
   D) 36.9

3. 2.7 + 3.4 + 9.76 =
   A) 10.37
   B) 14.87
   C) 15.86
   D) 13.79

4. 6.3 + .8 =
   A) 14.3
   B) .71
   C) 6.38
   D) 7.1

5. .03 + .3 =
   A) .6
   B) .33
   C) .06
   D) 3.3

6. 2.8 + .37 =
   A) .65
   B) 3.17
   C) 6.5
   D) .317

7. .59 + 1.4 =
   A) 1.99
   B) .73
   C) 7.3
   D) .199

8. .47 + .5 =
   A) 9.7
   B) .52
   C) 5.2
   D) .97

d = 11.970

0770 Multiplying decimal fractions.

The learner will select the product for multiplication of two decimal fractions which do not exceed three digits.

Directions: Select the product for the problem.

1. 435 X 3.1 =
   A) .13485
   B) 1.3485
   C) 13.485
   D) 1348.5

2. 3.2 X 5.4 =
   A) 1.728
   B) 17.28
   C) .1728
   D) 172.8

3. 3.5 X 42 =
   A) .1855
   B) 18.55
   C) 185.5
   D) 1.47

4. .321 X .43 =
   A) .13803
   B) .013803
   C) 138.03
   D) 13.803

5. 5.32 X .21 =
   A) 111.72
   B) 1.1172
   C) .11172
   D) 11172

6. 5.12 X 4.1 =
   A) 20.992
   B) 2099.2
   C) 209.92
   D) .20992

7. 23.5 X .33 =
   A) .07755
   B) 7.755
   C) 77.55
   D) 775.5

8. .321 X .21 =
   A) .06741
   B) 6.741
   C) 67.41
   D) .6741

d = 12.095

0780 Determining equations and solutions for word problems of subtraction.

The learner will identify the equations and solutions for one-step word problems involving subtraction.

Directions: Identify the equation and solution for the problem.

1. **There are 32604 books in a certain library. If 18489 of the books are fiction, how many are nonfiction?**

A) 32604 + y = 18489; y = 14115 nonfiction
B) 32604 − 18489 = y; y = 14115 nonfiction
C) $\frac{32604}{18489} = y$; y = 1763 nonfiction
D) 32604 + 18489 = y; y = 51093 nonfiction

2. **The seating capacity for the Rose Bowl is 103839 people. The seating capacity of the Sugar Bowl is 80985 people. How many more people does the Rose Bowl seat?**

A) 103839 + 80985 = y; y = 184824 people
B) 103839 − 80985 = y; y = 22,854 people
C) 103839 + y = 80985; y = 22854 people
D) $\frac{103839}{80985} = y$; y = 1282 people

3. **Celinda offered to sell 45 tickets to the annual PTA movie at her school. How many tickets had she sold when she still had 19 tickets left?**

A) 45 + 19 = y; y = 64 tickets
B) $\frac{45}{19} = y$; y = 23 tickets
C) 45 + y = 19; y = 64 tickets
D) 45 − 19 = y; y = 26 tickets

4. **In a recent year, a total of 116,423 forest fires were reported. The number of forest fires that were man-caused was 103619. How many were not man-caused?**

A) $\frac{116423}{103619} = y$; y = 11235 not man-caused fires
B) 116423 + 103619 = y; y = 220042 not man-caused fires
C) 103619 − y = 116423; y = 12804 not man-caused fires
D) 116423 − 103619 = y; y = 12804 not man-caused fires

5. **Jim weighs 143 pounds. Frank weighs 94 pounds. How much more does Jim weigh?**
   - A) $143 + y = 94$; $y = 49$ pounds
   - B) $94 - y = 143$; $y = 237$ pounds
   - C) $143 - 94 = y$; $y = 49$ pounds
   - D) $\frac{143}{94} = y$; $y = 15.2$ pounds

6. **The students at Martin Luther King Junior High School collected newspaper, aluminum cans, and glass for recycling. The first month they collected 3762 pounds of glass. The second month they collected 1785 pounds of glass. How many more pounds had they collected the first month?**
   - A) $3762 - 1785 = y$; $y = 1977$ pounds
   - B) $y + 1785 = 3762$; $y = 1977$ pounds
   - C) $\frac{3762}{1785} = y$; $y = 2023$ pounds
   - D) $3762 - y = 1785$; $y = 2023$ pounds

7. **The Justice Department reported that in 1971, 1098 youths ages 11-12 and 10622 youths ages 13-14 were arrested for violating the narcotic drug laws. How many more youths 13-14 years old were arrested for this offense?**
   - A) $10622 + 1098 = y$; $y = 11720$ youths 13-14 years old
   - B) $10622 + y = 1098$; $y = 9524$ youths 13-14 years old
   - C) $10622 - 1098 = y$; $y = 9524$ youths 13-14 years old
   - D) $\frac{10622}{1098} = y$; $y = 9674$ youths 13-14 years old

0790 Recognizing decimals.

The learner will identify the numerical form for decimals in word form and vice versa using up to three digits to the right and left of the decimal point.

Directions: Find the word name for the decimal numeral.

1. 2.4 =
   - A) two and four tenths
   - B) twenty-four
   - C) twenty-four hundredths
   - D) two and four hundredths

2. .34
   - A) thirty-four tenths
   - B) thirty-four hundredths
   - C) point thirty-four
   - D) thirty-four

3. .257 =
   - A) point two fifty-seven
   - B) two hundred fifty-seven
   - C) two hundred fifty-seven thousandths
   - D) two hundred fifty-seven hundredths

Directions: Find the decimal numeral that is expressed by the word name.

4. **six-tenths**
   - A) .6
   - B) .06
   - C) 6
   - D) 610

5. **Seventy-two hundredths**
   - A) 720
   - B) .72
   - C) 7.2
   - D) 72

6. **eight-tenths**
   - A) 8.0
   - B) .8
   - C) 8.
   - D) .80

7. **Twenty-four hundredths**
   - A) .24
   - B) 2.4
   - C) 240
   - D) 24.

8. **five hundredths**
   - A) .50
   - B) 500
   - C) .05
   - D) .5

d = 12.140

0800 Recognizing mixed numbers for improper fractions.

The learner will identify the mixed number for an improper fraction or the improper fraction for a mixed number.

Directions: Select the mixed numeral that is equal to the fraction or the fraction equal to the mixed numeral.

1. $\frac{23}{3} =$

   A) $3\frac{2}{7}$

   B) $7\frac{1}{2}$

   C) $7\frac{2}{3}$

   D) $7\frac{3}{2}$

2. $\frac{31}{8} =$

   A) $3\frac{1}{8}$

   B) $3\frac{7}{8}$

   C) $30\frac{1}{8}$

   D) $\frac{8}{31}$

3. $\frac{25}{6} =$

   A) $2\frac{5}{6}$

   B) $20\frac{5}{6}$

   C) $\frac{6}{25}$

   D) $4\frac{1}{6}$

4. $1\frac{7}{8} =$

   A) $\frac{15}{8}$

   B) $\frac{17}{18}$

   C) $\frac{7}{8}$

   D) $\frac{8}{8}$

0800 (continued)

5. $3\frac{2}{3} =$

A) $\frac{2}{9}$

B) $\frac{6}{9}$

C) $\frac{11}{3}$

D) $\frac{6}{3}$

6. $3\frac{4}{5} =$

A) $\frac{12}{15}$

B) $\frac{7}{8}$

C) $\frac{19}{5}$

D) $\frac{7}{5}$

7. $7\frac{2}{3} =$

A) $\frac{9}{10}$

B) $\frac{23}{3}$

C) $\frac{14}{21}$

D) $\frac{9}{3}$

8. $6\frac{1}{4} =$

A) $\frac{7}{4}$

B) $\frac{6}{24}$

C) $\frac{7}{10}$

D) $\frac{25}{4}$

d = 12.155

0810 Determining equations and solutions for word problems of addition.

The learner will identify the equations and solutions for one-step word problems involving addition.

Directions: Identify the equation and solution for the problem.

1. **A certain orchard contains 925 apple trees, 378 cherry trees, and 461 peach trees. How many trees are there in the orchard?**
   A) $(925 + 378) - 461 = y$; $y = 842$ trees
   B) $925 - (378 + 461) = y$; $y = 86$ trees
   C) $y = 925 \times 378 \times 461$; $y = 161188650$ trees
   D) $925 + 378 + 461 = y$; $y = 1764$ trees

2. **The students at Martin Luther King Junior High School collected newspapers, aluminum cans, and glass for recycling. In four months they collected the following number of pounds of newspaper: 5578, 3932, 2781, and 4390. How many pounds had they collected in all?**
   A) $5578 + 3932 + 2781 + 4390 = y$; $y = 16681$ pounds
   B) $(5578 + 3932) - (2781 + 4390) = y$; $y = 2339$ pounds
   C) $(5578 \times 3932) - (2781 \times 4390) = y$; $y = 1.87$ pounds
   D) $\frac{(5578 \times 3932)}{(2781 \times 4390)} = y$; $y = 1.87$ pounds

3. **In Gemini Junior High School, there are 876 seventh graders, 735 eighth graders, and 942 ninth graders. How many studetns are there in all?**
   A) $(876 + 735) + y = 942$; $y = 2553$ students
   B) $\frac{(876 + 735 + 942)}{y} = 3$; $y = 8510$ students
   C) $y = (876 + 735) - 942$; $y = 6690$ students
   D) $(876 + 735) + 942 = y$; $y = 2553$ students

4. **A film processor developed 8419 rolls of color film and 14372 rolls of black-and-white film. How many rolls were developed in all?**
   A) $14372 - 8419 = x$; $x = 59530$ rolls
   B) $8419 + x = 14372$; $x = 22791$ rolls
   C) $\frac{14372}{8419} = x$; $x = 17071$ rolls
   D) $8419 + 14372 = x$; $x = 22791$ rolls

0810 (continued)

5. **Marc spent $97.89 for a guitar and $169.95 for an amplifier. How much did he spend in all?**
   - A) $97.89 + y = $169.95;   y = $267.84
   - B) $\frac{\$169.95}{\$97.89} = y$;   y = $173
   - C) $97.89 + $169.95 = y;   y = $267.84
   - D) y = $169.95 = $97.89;   y = $267.84

6. **Of juvenile offenders taken into custody, 627,744 were referred to juvenile court, 11,554 were referred to adult court, and 19,754 were referred to welfare agencies. How many juveniles were referred to the courts and welfare agencies in all?**
   - A) (627,744 − 11,554) + 19,754 = y;   y = 635,944 juveniles
   - B) (627,744 + 11,554) − 19,754 = y;   y = 619,534 juveniles
   - C) (627,744 + 11,554) − y = 19,754;   y = 619,534 juveniles
   - D) (627,744 + 11,554) + 19,754 = y;   y = 659,052 juveniles

7. **In one month, a certain gasoline station sold 38472 gallons of low-lead gas, 184317 gallons of regular gas, 96508 gallons of premium gas, and 149612 gallons of diesel oil. What was the total number of gallons sold?**
   - A) (38472 + 184317) + (96508 + 149612) = y;   y = 468909 gallons
   - B) $\frac{(38472 + 184317)}{(96508 + 149612)} = y$;   y = 1953202 gallons
   - C) (96508 X 149612) + (38472 X 184317) = y;   y = 675217 gallons
   - D) y + (38472 + 184317) = (96508 + 149612);   y = 468909 gallons

8. **A survey showed that there were 15392 dwelling units in a certain town on January 1. If 1341 more units were built there during the year, how many dwelling units were there in the town at the end of the year?**
   - A) 15392 + y = 1341;   y = 16733 dwelling units
   - B) $\frac{15392}{1341} = y$;   y = 11.47 dwelling units
   - C) 15392 − 1341 = y;   y = 14051 dwelling units
   - D) 15392 + 1341 = y;   y = 16733 dwelling units

d = 12.195

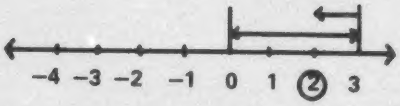
0820 Using a number line for addition of integers.

The learner will add any two members of this set: (−20, −19, −18, . . ., 18, 19, 20) using a number line.

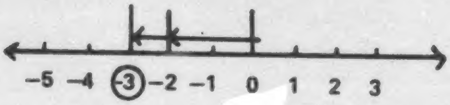
Directions: Choose the number line that illustrates each addition problem.

1. 3 + −1

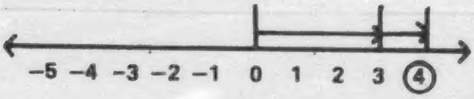
A)



B)

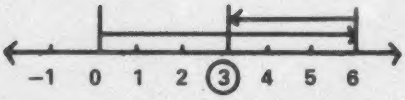


C)

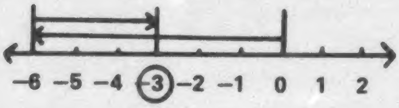

−5 −4 −3 −2 −1 0 1 2 3 ④

2. 6 + −3

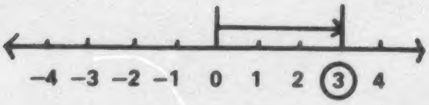
A)



B)



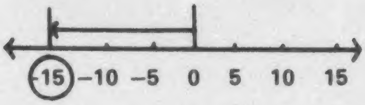
C)



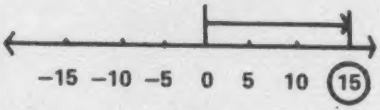
0820 (continued)

3. −15 + 15

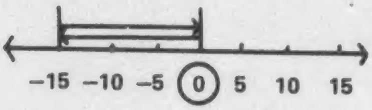
A)


−15 −10 −5 0 5 10 15

B)

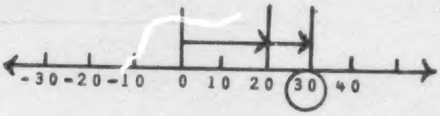

−15 −10 −5 0 5 10 15

C)

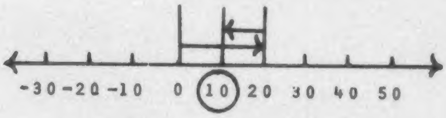

−15 −10 −5 0 5 10 15

4. 20 + −10

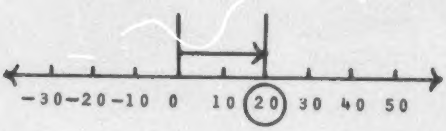
A)


-30-20-10 0 10 20 30 40

B)

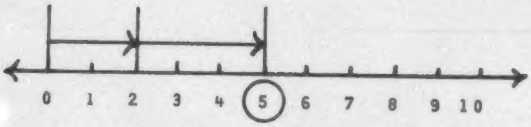

-30-20-10 0 10 20 30 40 50

C)

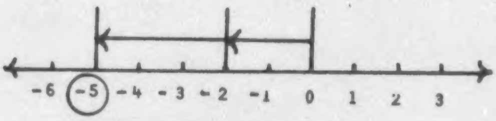

-30-20-10 0 10 20 30 40 50

5. −2 + −3

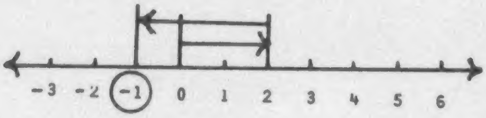
A)


0 1 2 3 4 5 6 7 8 9 10

B)


-6 -5 -4 -3 -2 -1 0 1 2 3

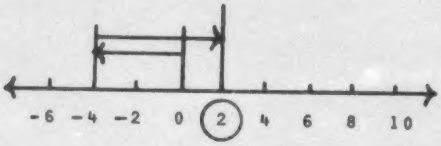
C)


-3 -2 -1 0 1 2 3 4 5 6

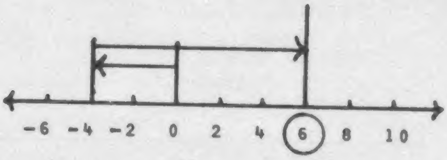
0820 (continued)

6. $-4 + 6$

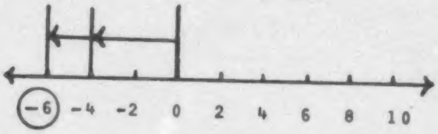
A)


-6 -4 -2 0 2 4 6 8 10

B)

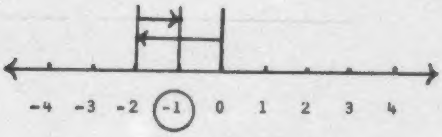

-6 -4 -2 0 2 4 6 8 10

C)

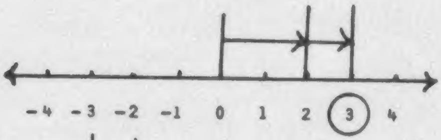

-6 -4 -2 0 2 4 6 8 10

7. $-2 + -1$

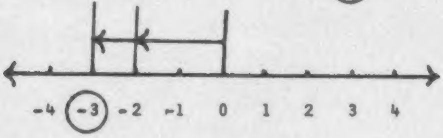
A)



B)



C)



d = 12.210

0830 Determining products of integers.

The learner will find the product of two integers.

Directions: Find the product of the two integers.

1. $16 \times 3 =$
   - A) -48
   - B) 19
   - C) 48
   - D) 64

2. $16 \times 2 =$
   - A) 32
   - B) -32
   - C) 18
   - D) 14

3. $13 \times -3 =$
   - A) -39
   - B) 10
   - C) -26
   - D) 39

4. $-4 \times -3 =$
   - A) -7
   - B) 7
   - C) -12
   - D) 12

5. $-8 \times -9 =$
   - A) -72
   - B) -17
   - C) 17
   - D) 72

6. $-8 \times 4 =$
   - A) 32
   - B) -12
   - C) -32
   - D) -4

7. $-4 \times -12 =$
   - A) 48
   - B) -48
   - C) 16
   - D) -36

8. $-12 \times -12 =$
   - A) -24
   - B) -144
   - C) 144
   - D) 24

d = 12.340

0840 Identifying fractions for decimals.

Given any decimal through thousandths, the learner will express the decimal as a fraction.

Directions: Find the common fraction equivalent to the decimal fraction.

1. .79 =

A) $\frac{79}{1000}$

B) $\frac{79}{10}$

C) $\frac{79}{1}$

D) $\frac{79}{100}$

2. .09 =

A) $\frac{9}{100}$

B) $\frac{9}{1}$

C) $\frac{9}{10}$

D) $\frac{90}{10}$

3. .01 =

A) $\frac{01}{10}$

B) $\frac{1}{100}$

C) $\frac{1}{10}$

D) $\frac{1}{1}$

4. .293 =

A) $\frac{293}{100}$

B) $\frac{293}{1}$

C) $\frac{293}{10}$

D) $\frac{293}{1000}$

0840 (continued)

5. .147 =

A) $\frac{147}{1}$

B) $\frac{147}{10}$

C) $\frac{147}{1000}$

D) $\frac{147}{100}$

6. .037 =

A) $\frac{37}{10}$

B) $\frac{37}{1000}$

C) $\frac{37}{1}$

D) $\frac{37}{100}$

7. .097 =

A) $\frac{97}{1000}$

B) $\frac{97}{1}$

C) $\frac{97}{10}$

D) $\frac{97}{100}$

0850 Determining equations and solutions for word problems of multiplication.

The learner will identify the equations and solutions for one-step problems involving multiplication.

Directions: Identify the equation and solution for the problem.

1. **Michael earns \$1.75 per hour doing yard work. One month he worked 63 hours. How much did he earn?**

A) $\frac{63}{\$1.75} = y$; $y = \$36$
B) $\$1.75 \times 63 = y$; $y = \$110.25$
C) $\$1.75 \times \frac{1}{63} = y$; $y = \$279$
D) $63 \times y = \$1.75$; $y = \$110.25$

2. **Mr. Reed owns a real estate agency. The agency received an average fee of \$2160 for selling each house this year. What were its earnings on the 591 houses that were sold this year?**

A) $\frac{\$2160}{\$591} = y$; $y = \$365482$
B) $\$2160 \times 591 = y$; $y = \$1276560$
C) $\$591 \times \frac{1}{\$2160} = y$; $y = \$1276560$
D) $591 \times y = \$2160$; $y = \$365482$

3. **Shirley is a stock clerk. One month she unpacked and shelved 147 cases of canned goods. Each case contained 48 cans. How many cans did she shelve in all?**

A) $\frac{147}{48} = y$; $y = 3060$ cans
B) $48 \times y = 147$; $y = 7056$ cans
C) $48 \times \frac{1}{147} = y$; $y = 3265$ cans
D) $147 \times 48 = y$; $y = 7056$ cans

0850 (continued)

4. **A real estate agent sold 34 houses this year. He received an average commission of $428 per house. How much did he receive in commissions in all?**
   A) $\$428 + 34 = y;\ \ y = \$462$
   B) $34 \times y = \$428;\ \ y = \$14552$
   C) $\frac{\$428}{34} = y;\ \ y = \$12588$
   D) $\$428 \times 34 = y;\ \ y = \$14552$

5. **Mr. Reed employs 26 real estate agents. Each agent earns a regular weekly salary of $85, plus a commission on each house he sells. How much does Mr. Reed pay his agents as salaries per week?**
   A) $\frac{\$85}{26} = y;\ \ y = \$3268$
   B) $\$85 \times \frac{1}{26} = y;\ \ y = \$2210$
   C) $\$85 \times y = 26;\ \ y = \$3268$
   D) $26 \times \$85 = y;\ \ y = \$2210$

6. **During the past ten years, a real estate agency has helped 647 buyers obtain mortgages for their homes. The average mortgage was $19900. How much money was obtained through the agency's help in all?**
   A) $\$19900 + 647 = y;\ \ y = \$20547$
   B) $y = \$19900 \times 647;\ \ y = \$12875300$
   C) $\frac{\$19900}{647} = y;\ \ y = \$3075734$
   D) $\$19900 = 647 \times y;\ \ y = \$12875300$

7. **A real estate agent drives an average of 379 miles per week showing buyers the houses that are for sale. How many miles does he drive in one year?**
   A) $y = 379 \times 52;\ \ y = 19708$ miles
A B) $379 = 52 \times y;\ \ y = 19708$ miles
   C) $\frac{379}{52} = y;\ \ y = 72884$ miles
   D) $y = \frac{52}{379};\ \ y = 13720$ miles

8. **Roger read that a certain transport truck had a capacity of 814 cubic feet. He knew that the measure of 1 cubic foot was equivalent to 8 gallons. How many gallons of gasoline would the truck hold?**

A) $814 \times y = 8$; $y = 6512$ gallons

B) $\frac{814}{8} = y$; $y = 10175$ gallons

C) $814 \times \frac{1}{8} = y$; $y = 101.75$ gallons

D) $y = 814 \times 8$; $y = 6512$ gallons

d = 12.475

0860 Dividing a decimal fraction by a whole number.

The learner will determine the quotient for division of a decimal fraction not to exceed three digits.

Directions: Select the quotient for the problem.

1. $6\overline{)14.4}$ =
   A) .240
   B) 2.4
   C) .24
   D) 24.

2. $5\overline{)6.35}$ =
   A) 12.7
   B) .127
   C) 127.
   D) 1.27

3. $67\overline{)46.9}$ =
   A) .7
   B) 7.
   C) 7.0
   D) .07

4. $54\overline{)37.8}$ =
   A) 7.
   B) .7
   C) .07
   D) 70.

5. $43\overline{)55.9}$ =
   A) .13
   B) 13.
   C) 1.3
   D) 1.03

6. $45\overline{)3.15}$ =
   A) .07
   B) 7.
   C) .7
   D) .70

7. $37\overline{)4.81}$ =
   A) 13.
   B) .13
   C) 1.30
   D) 1.3

8. $8\overline{).432}$ =
   A) .54
   B) 54.
   C) .540
   D) .054

d = 12.480

0870 Recognizing perpendicular and parallel lines.

The learner will identify perpendicular and parallel lines in given sets of lines and select the appropriate description of each.

Directions: Select the answer that is true for the given drawing.

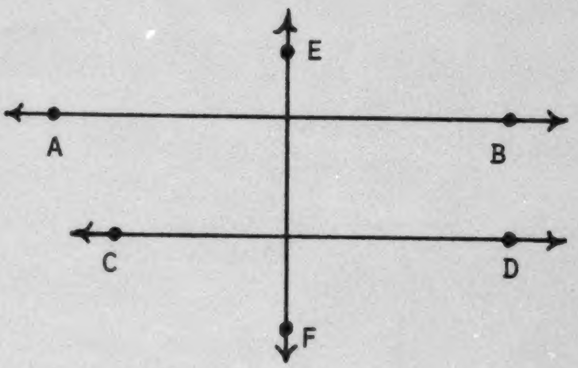
1.

A) $\overleftrightarrow{AB}$ is parallel to $\overleftrightarrow{CD}$

B) $\overleftrightarrow{AB}$ is not parallel to $\overleftrightarrow{CD}$

C) $\overleftrightarrow{AB}$ intersects $\overleftrightarrow{CD}$

D) $\overleftrightarrow{AB}$ is perpendicular to $\overleftrightarrow{CD}$



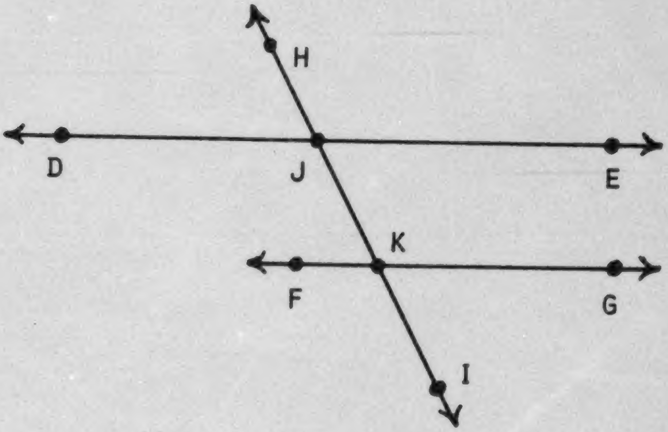
2.

A) $\overleftrightarrow{HI}$ is parallel to $\overleftrightarrow{DE}$

B) $\overleftrightarrow{HI}$ is perpendicular to $\overleftrightarrow{DE}$

C) $\overleftrightarrow{HI}$ intersects $\overleftrightarrow{DE}$

D) $\overleftrightarrow{DE}$ is not parallel to $\overleftrightarrow{FG}$



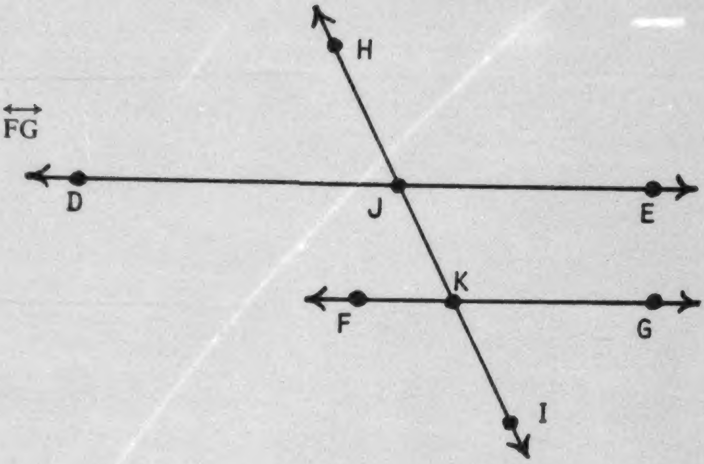
3.

A) $\overleftrightarrow{DE}$ is parallel to $\overleftrightarrow{FG}$

B) $\overleftrightarrow{HI}$ is perpendicular to $\overleftrightarrow{DE}$ and $\overleftrightarrow{FG}$

C) $\overleftrightarrow{DE}$ intersects $\overleftrightarrow{FG}$

D) $\overleftrightarrow{HI}$ is parallel to $\overleftrightarrow{DE}$ and $\overleftrightarrow{FG}$



0870 (continued)

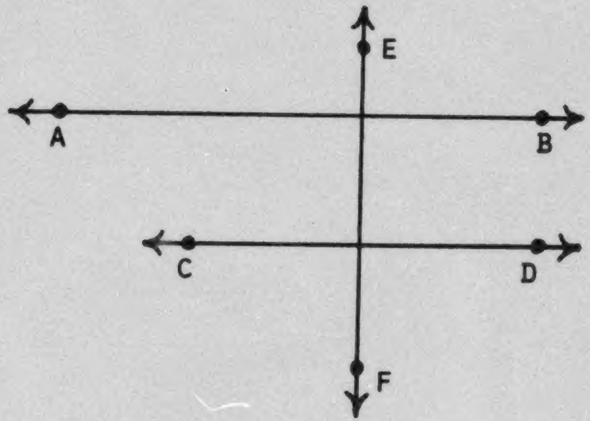
4.

A) $\overleftrightarrow{EF}$ is parallel to $\overleftrightarrow{AB}$

B) $\overleftrightarrow{EF}$ is perpendicular to $\overleftrightarrow{AB}$

C) $\overleftrightarrow{AB}$ is perpendicular to $\overleftrightarrow{CD}$

D) $\overleftrightarrow{EF}$ intersects and is parallel to $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$



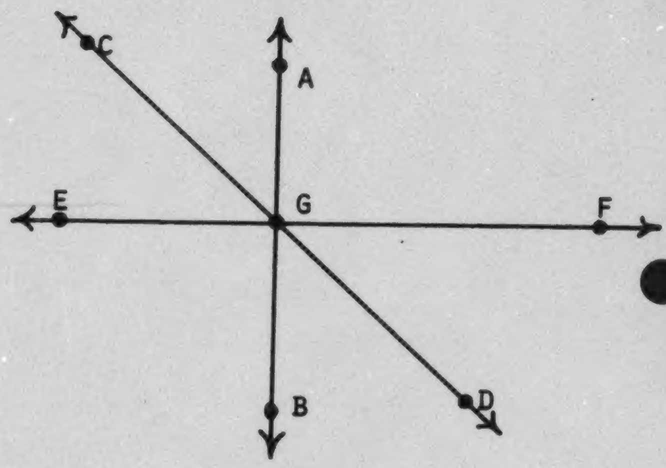
5.

A) $\overleftrightarrow{AB}$ is perpendicular to $\overleftrightarrow{CD}$

B) $\overleftrightarrow{AB}$ is perpendicular to $\overleftrightarrow{EF}$

C) $\overleftrightarrow{AB}$ is parallel to $\overleftrightarrow{EF}$

D) $\overleftrightarrow{CD}$ is perpendicular to $\overleftrightarrow{EF}$



d = 12.570

0880 Identifying fractions in lowest terms.

Given sets of fractions, the learner can identify the fraction in lowest terms.

Directions: Select the answer that names the equivalent fraction in lowest terms.

1. $\boxed{\frac{4}{10} =}$

   A) $\frac{4}{5}$

   B) $\frac{2}{5}$

   C) $\frac{1}{10}$

   D) $\frac{4}{10}$

2. $\boxed{\frac{63}{81} =}$

   A) $\frac{63}{81}$

   B) $\frac{9}{7}$

   C) $\frac{63}{9}$

   D) $\frac{7}{9}$

3. $\boxed{\frac{18}{48} =}$

   A) $\frac{6}{12}$

   B) $\frac{2}{4}$

   C) $\frac{3}{8}$

   D) $\frac{18}{48}$

4. $\boxed{\frac{28}{45} =}$

   A) $\frac{28}{45}$

   B) $\frac{7}{9}$

   C) $\frac{4}{9}$

   D) $\frac{4}{5}$

0880 (continued)

5. $\boxed{\frac{8}{27} =}$

A) $\frac{4}{9}$

B) $\frac{2}{3}$

C) $\frac{4}{3}$

D) $\frac{8}{27}$

6. $\boxed{\frac{5}{20} =}$

A) $\frac{5}{4}$

B) $\frac{5}{20}$

C) $\frac{1}{5}$

D) $\frac{1}{4}$

7. $\boxed{\frac{32}{20} =}$

A) $\frac{16}{10}$

B) $\frac{4}{5}$

C) $\frac{8}{10}$

D) $\frac{8}{5}$

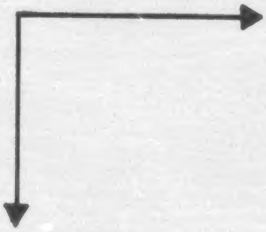
d = 12.605

0890 Identifying angles.

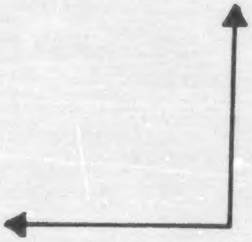
Using a protractor, the learner will classify angles as right angles, acute angles, or obtuse angles according to the number of degrees in each angle.

Directions: Select the correct name for the angle given. (You may use a protractor to help you classify the angles.)

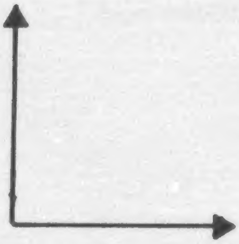
1.
A) right angle
B) acute angle
C) obtuse angle
D) none of the above



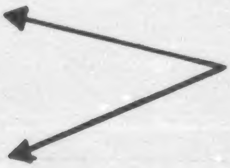
2.
A) right angle
B) acute angle
C) obtuse angle
D) none of the above



3.
A) right angle
B) acute angle
C) obtuse angle
D) none of the above

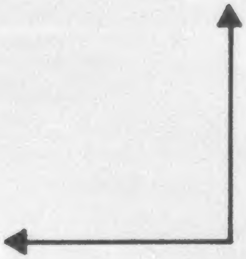


4.
A) right angle
B) acute angle
C) obtuse angle
D) none of the above



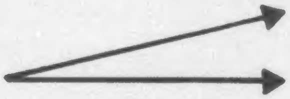
0890 (continued)

5.



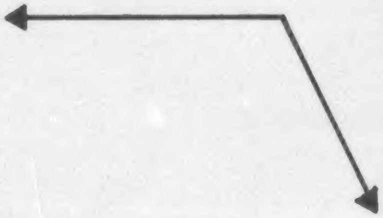
A) right angle
B) acute angle
C) obtuse angle
D) none of the above

6.



A) right angle
B) acute angle
C) obtuse angle
D) none of the above

7.



A) right angle
B) acute angle
C) obtuse angle
D) none of the above

d = 12.610

0900 Identifying decimals for fractions.

Given fractions with denominators of 10, 100, 1000, 10,000, or 100,000, the learner will identify the decimals for the fractions.

Directions: Select the decimal fraction that is equivalent to the common fraction given.

1. $\frac{5}{1000} =$

   A) .5
   B) .500
   C) .05
   D) .005

2. $\frac{3}{10} =$

   A) .3
   B) 3.
   C) .03
   D) 3.0

3. $\frac{4}{10} =$

   A) .4
   B) 4.
   C) .04
   D) 4.0

4. $\frac{24}{1000} =$

   A) .024
   B) .24
   C) .240
   D) .0024

5. $\frac{364}{1000} =$

   A) 3.640
   B) .364
   C) .0364
   D) .00364

6. $\frac{432}{10000} =$

   A) .0432
   B) .4320
   C) .00432
   D) .432

7. $\frac{42}{1000} =$

   A) .042
   B) .42
   C) .420
   D) .0042

d = 12.675

0910 Determining value of formulas.

Using given values of the necessary variables, the learner will find the value of formulas.

Directions: Find the value of n for each equation.

1. **If $m + y = n$, $m = 6$ and $y = 3$, what is the value of n?**
   A) 9
   B) 3
   C) 6

2. **If $m - y = n$, and $m = 6$ and $y = 2$, what is the value of n?**
   A) 6
   B) 8
   C) 4

3. **If $y + 4 = n$, and $y = 2$, what is the value of n?**
   A) 4
   B) 2
   C) 6

4. **If $m + p = n$, and $m = -4$ and $p = -3$, what is the value of n?**
   A) 7
   B) −7
   C) −1

5. **If $3x + 2 = n$, and $x = 6$, what is the value of n?**
   A) 20
   B) 11
   C) 5

6. **If $y + 3p = n$, and $y = 6$ and $p = 3$, what is the value of n?**
   A) 15
   B) 9
   C) 6

7. **If m + y = n, and m = 4 and y = −3, what is the value of n?**
   A) 7
   B) 1
   C) 4

8. **If 2m + m = n, and m = 4, what is the value of n?**
   A) 10
   B) 8
   C) 12

d = 12.840

0920 Identifying prime factorization of composite numbers.

Given composite numbers not greater than 100, the learner will identify the prime factorization of each.

Directions: Select the *prime* factorization for the following composite numbers.

1. 36 =
   A) 2 × 2 × 3 × 3
   B) 2 × 18
   C) 3 × 12
   D) 2 × 2 × 9

2. 40 =
   A) 2 × 2 × 2 × 5
   B) 2 × 20
   C) 5 × 8
   D) 5 × 4 × 2

3. 24 =
   A) 2 × 12
   B) 2 × 2 × 2 × 3
   C) 6 × 4
   D) 3 × 8

4. 56 =
   A) 2 × 2 × 2 × 7
   B) 2 × 2 × 14
   C) 4 × 14
   D) 2 × 28

5. 60 =
   A) 12 × 5
   B) 2 × 2 × 3 × 5
   C) 2 × 30
   D) 4 × 15

6. 42 =
   A) 2 × 21
   B) 2 × 3 × 7
   C) 14 × 3
   D) 6 × 7

7. 48 =
   A) 16 × 3
   B) 2 × 2 × 2 × 6
   C) 2 × 2 × 2 × 2 × 3
   D) 2 × 24

d = 12.875

0930 Subtracting fractions with regrouping.

The learner will determine the differences in simplest terms for subtraction of fractions or mixed numbers from whole numbers. Denominators will not be greater than one digit.

Directions: Find the remainder of the two numbers and express in *simplest* terms.

1.
$$\begin{array}{r} 6 \\ -\ \frac{3}{5} \\ \hline \end{array}$$

A) $6\frac{2}{5}$

B) $5\frac{3}{5}$

C) $5\frac{2}{5}$

D) $6\frac{3}{5}$

2.
$$\begin{array}{r} 3 \\ -\ \frac{1}{3} \\ \hline \end{array}$$

A) $2\frac{1}{3}$

B) $2\frac{2}{3}$

C) $3\frac{1}{3}$

D) $3\frac{2}{3}$

3.
$$\begin{array}{r} 5 \\ -\ \frac{5}{6} \\ \hline \end{array}$$

A) $5\frac{5}{6}$

B) $4\frac{5}{6}$

C) $5\frac{1}{6}$

D) $4\frac{1}{6}$

4.
$$\begin{array}{r} 4 \\ -\ \frac{3}{7} \\ \hline \end{array}$$

A) $3\frac{4}{7}$

B) $4\frac{4}{7}$

C) $3\frac{3}{7}$

D) $4\frac{3}{7}$

5.
$$\begin{array}{r} 8 \\ -4\frac{4}{5} \\ \hline \end{array}$$

A) $3\frac{4}{5}$

B) $4\frac{1}{5}$

C) $4\frac{4}{5}$

D) $3\frac{1}{5}$

6.
$$\begin{array}{r} 5 \\ -3\frac{1}{4} \\ \hline \end{array}$$

A) $1\frac{3}{4}$

B) $2\frac{1}{4}$

C) $1\frac{1}{4}$

D) $2\frac{3}{4}$

d = 12.905

0940 Subtracting decimals.

The learner will find the differences of decimals through the thousandths place.

Directions: Find the difference for the two numbers.

1. .72 – .28 =
   - A) 1.00
   - B) .56
   - C) .46
   - D) .44

2. 1.42 – .1372 =
   - A) 1.3172
   - B) .0048
   - C) 1.2828
   - D) 1.2827

3. .53 – .4 =
   - A) .49
   - B) .13
   - C) .10
   - D) 4.9

4. .674 – .38 =
   - A) .636
   - B) .294
   - C) 6.36
   - D) 2.94

5. 5.8 – .47 =
   - A) 5.33
   - B) 1.1
   - C) 5.47
   - D) .11

6. 6.4 – .32 =
   - A) 6.12
   - B) .32
   - C) 3.2
   - D) 6.08

7. 6.3 – .18 =
   - A) 6.28
   - B) 6.12
   - C) 4.5
   - D) .45

d = 12.915

0950 Identifying expanded form of whole numbers using exponents.

The learner will identify the expanded form of a whole number less than ten million using exponents.

The learner will identify an equivalent number in the compact or standard form for a given numeral in expanded form, where the power of ten does not exceed six.

Directions: Select the expanded form that is equivalent to the number given.

1. **43210 =**

A) $(4 \times 10^4) + (3 \times 10^3) + (2 \times 10^2) + (1 \times 10^1) + (0 \times 1)$
B) $(4 \times 10^3) + (3 \times 10^2) + (2 \times 10^1) + (10)$
C) $(43 \times 10^3) + (21 \times 10^2)$
D) $(4 \times 10^4) + (3 \times 10^3) + (2 \times 10^2) + (1 \times 10^1) + (1 \times 1)$

Directions: Select the numeral that is equivalent to the expanded form given.

2. $(1 \times 10^4) + (0 \times 10^3) + (3 \times 10^2) + (8 \times 10^1) + (4 \times 1) =$

A) 10381
B) 1384
C) 10384
D) 432

3. $(4 \times 10^4) + (3 \times 10^3) + (2 \times 10^2) + (1 \times 10^1) + (9 \times 1) =$

A) 43211
B) 432109
C) 43219
D) 432

Directions: Select the expanded form that is equivalent to the numeral given.

4. 32107 =

A) $(3 \times 10^3) + (2 \times 10^2) + (1 \times 10^1) + (7 \times 1)$
B) $(3 \times 10^4) + (2 \times 10^3) + (1 \times 10^2) + (0 \times 10^1) + (7 \times 1)$
C) $(321 \times 10^3) + (7 \times 1)$
D) $(32 \times 10^3) + (107 \times 10^2)$

5. 60513 =

A) $(6 \times 10^4) + (5 \times 10^3) + (1 \times 10^2) + (3 \times 1)$
B) $(6 \times 10^3) + (5 \times 10^2) + (1 \times 10^1) + (3 \times 1)$
C) $(60 \times 10^3) + (5 \times 10^2) + (1 \times 10^1) + (1 \times 1)$
D) $(6 \times 10^4) + (0 \times 10^3) + (5 \times 10^2) + (1 \times 10^1) + (3 \times 1)$

6. 3407392 =

A) $(3 \times 10^6) + (4 \times 10^5) + (7 \times 10^4) + (3 \times 10^3) + (9 \times 10^2) + (2 \times 10^1)$
B) $(3 \times 10^7) + (4 \times 10^6) + (0 \times 10^5) + (7 \times 10^4) + (3 \times 10^3) + (9 \times 10^2) + (2 \times 10^1)$
C) $(3 \times 10^6) + (4 \times 10^5) + (0 \times 10^4) + (7 \times 10^3) + (3 \times 10^2) + (9 \times 10^1) + (2 \times 1)$
D) $(3 \times 10^5) + (4 \times 10^4) + (7 \times 10^2) + (3 \times 10^1) + (9 \times 10^0) + (2 \times 1)$

Directions: Select the numeral that is equivalent to the expanded form given.

7. $(4 \times 10^5) + (6 \times 10^4) + (0 \times 10^3) + (3 \times 10^2) + (7 \times 1) =$

A) 4637
B) 46037
C) 46307
D) 460,307

d = 12.975

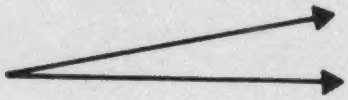
0960 Using a protractor to measure angles.

The learner will identify the correct measurement of angles using a protractor. The measurement should be correct within 5 degrees.

Directions: Use a protractor to measure the given angles. Select the answer that is the correct measurement for the angle.

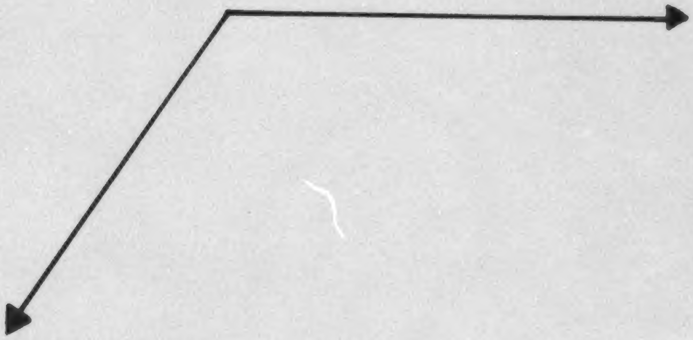
1.

A) 180°
B) 170°
C) 10°



2.

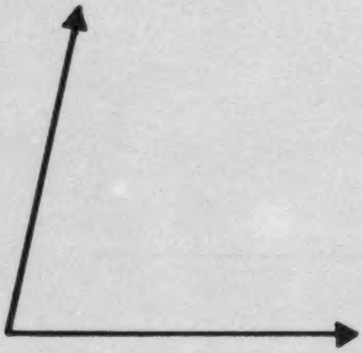
A) 124°
B) 56°
C) 136°



0960 (continued)

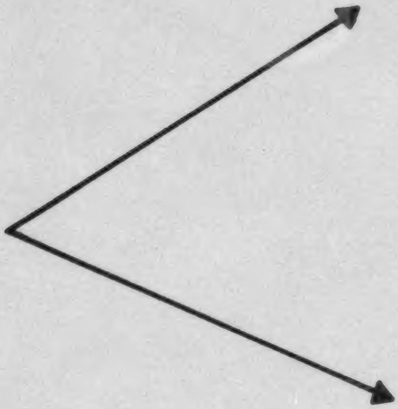
3.

A) 79°
B) 101°
C) 119°



4.

A) 125°
B) 135°
C) 55°



d = 13.085

0970 Multiplying fractions or mixed numbers by whole numbers.

The learner will multiply fractions or mixed numbers by a whole number and express the answer in simplest terms.

Directions: Find the product of the two numbers and express in *simplest* terms. Select mixed form when possible.

1. $5 \times \frac{1}{8} =$

A) $\frac{5}{40}$

B) $1\frac{3}{5}$

C) $\frac{1}{40}$

D) $\frac{5}{8}$

2. $2\frac{3}{4} \times 3 =$

A) $8\frac{1}{4}$

B) $3\frac{3}{4}$

C) $4\frac{1}{8}$

D) $\frac{11}{12}$

3. $\frac{3}{4} \times 9 =$

A) $\frac{27}{4}$

B) $6\frac{3}{4}$

C) $\frac{3}{36}$

D) $\frac{1}{12}$

4. $\frac{2}{3} \times 7 =$

A) $4\frac{2}{3}$

B) $1\frac{7}{21}$

C) $\frac{2}{21}$

D) $\frac{14}{21}$

0970 (continued)

5. $\frac{2}{3} \times 11 =$

A) $7\frac{1}{3}$

B) $\frac{2}{33}$

C) $\frac{22}{3}$

D) $3\frac{1}{7}$

6. $\frac{5}{6} \times 5 =$

A) $4\frac{1}{6}$

B) $\frac{5}{30}$

C) $\frac{1}{6}$

D) $\frac{25}{6}$

d = 13.120

0980 Adding and subtracting fractions with regrouping.

The learner will determine sums and differences in simplest terms for addition and subtraction problems of fractions and mixed numbers with regrouping. Denominators will not be greater than two digits.

Directions: Find the sum or difference of the two numbers and express in simplest terms. Select mixed form when possible.

1. $$\begin{array}{r} \frac{5}{8} \\ -\frac{1}{4} \\ \hline \end{array}$$

A) $\frac{4}{4}$

B) $\frac{3}{8}$

C) $\frac{4}{8}$

D) $\frac{3}{4}$

2. $$\begin{array}{r} 3\frac{1}{3} \\ +5\frac{3}{8} \\ \hline \end{array}$$

A) $8\frac{5}{11}$

B) $8\frac{4}{24}$

C) $8\frac{17}{24}$

D) $9\frac{7}{24}$

3. $$\begin{array}{r} \frac{5}{6} \\ +\frac{7}{8} \\ \hline \end{array}$$

A) $1\frac{17}{24}$

B) $\frac{17}{24}$

C) $1\frac{1}{3}$

D) $\frac{41}{24}$

4. $$\begin{array}{r} \frac{2}{3} \\ +\frac{5}{6} \\ \hline \end{array}$$

A) $\frac{6}{9}$

B) $1\frac{1}{2}$

C) $\frac{7}{9}$

D) $\frac{6}{7}$

0980 (continued)

5. $$\begin{array}{r} \frac{5}{6} \\ + \frac{2}{3} \\ \hline \end{array}$$

A) $\frac{9}{6}$

B) $1\frac{3}{6}$

C) $\frac{1}{2}$

D) $1\frac{1}{2}$

6. $$\begin{array}{r} 21\frac{4}{5} \\ -\ 7\frac{1}{3} \\ \hline \end{array}$$

A) $14\frac{3}{2}$

B) $14\frac{3}{15}$

C) $14\frac{7}{15}$

D) $13\frac{7}{15}$

7. $$\begin{array}{r} 5\frac{3}{4} \\ + 6\frac{5}{6} \\ \hline \end{array}$$

A) $11\frac{7}{12}$

B) $\frac{19}{12}$

C) $1\frac{7}{12}$

D) $12\frac{7}{12}$

d = 13.135

0990 Determining sums of integers.

The learner will find the sum of two integers.

Directions: Find the sum of the integers.

1. (−9) + (−11) =
   A) 2
   B) 20
   C) −20
   D) −2

2. −3 + −8 =
   A) −5
   B) 5
   C) −11
   D) 11

3. 16 + (−6) =
   A) 22
   B) 10
   C) −10
   D) 6

4. (−5) + 12 =
   A) −17
   B) 17
   C) 7
   D) −7

5. 2 + (−4) =
   A) 6
   B) 2
   C) −2
   D) −6

6. 4 + −9 =
   A) 13
   B) −5
   C) −13
   D) 5

7. −13 + 6 =
   A) 7
   B) 19
   C) −6
   D) −7

8. 8 + −1 =
   A) 7
   B) 9
   C) −9
   D) 8

1000 Determining quotients of integers.

The learner will find the quotient of two integers.

Directions: Find the quotient of the two integers.

1. 95 ÷ 5 =
   A) 475
   B) 19
   C) −19
   D) 18

2. −24 ÷ 3 =
   A) −27
   B) −8
   C) 7
   D) 8

3. −11 ÷ 1 =
   A) −1
   B) −11
   C) 1
   D) 11

4. 32 ÷ −4 =
   A) −8
   B) 8
   C) 7
   D) −7

5. −64 ÷ −4 =
   A) −16
   B) 256
   C) −256
   D) 16

6. −45 ÷ −9 =
   A) −4
   B) 4
   C) −5
   D) 5

7. 38 ÷ −2 =
   A) 16
   B) −16
   C) −19
   D) 19

d = 13.380

1010 Dividing a decimal fraction by a decimal fraction.

The learner will determine the quotient for division of a decimal fraction by a decimal fraction, neither to exceed three digits.

Directions: Select the quotient for the problem.

1. $.32\overline{)4.48}$
   - A) .14
   - B) 14.
   - C) .014
   - D) .140

2. $6.3\overline{).504}$
   - A) .008
   - B) .08
   - C) .8
   - D) 8.

3. $.23\overline{).345}$
   - A) 1.5
   - B) .015
   - C) 15.
   - D) .15

4. $.54\overline{)43.2}$
   - A) 80.
   - B) 8.
   - C) .80
   - D) .8

5. $.7\overline{)6.44}$
   - A) 9.2
   - B) .9
   - C) .92
   - D) 9.

6. $.6\overline{)43.8}$
   - A) 7.3
   - B) 73.
   - C) .73
   - D) 730.

7. $.7\overline{)8.47}$
   - A) .121
   - B) 12.1
   - C) 1.21
   - D) 121.

d = 13.385

1020 Identifying the reciprocal of any rational number.

The learner will identify the reciprocal of any rational number.

1. The reciprocal of $\frac{4}{5}$ is:

A) $\frac{4}{5}$

B) $\frac{5}{4}$

C) $-\frac{5}{4}$

D) 5

2. The reciprocal of $\frac{3}{2}$ is:

A) 2

B) $-\frac{2}{3}$

C) $\frac{6}{4}$

D) $\frac{2}{3}$

3. The reciprocal of $\frac{3}{4}$ is:

A) $\frac{6}{8}$

B) $\frac{3}{4}$

C) $-\frac{4}{3}$

D) $\frac{4}{3}$

4. The reciprocal of 8 is:

A) $\frac{1}{8}$

B) −8

C) $\frac{8}{1}$

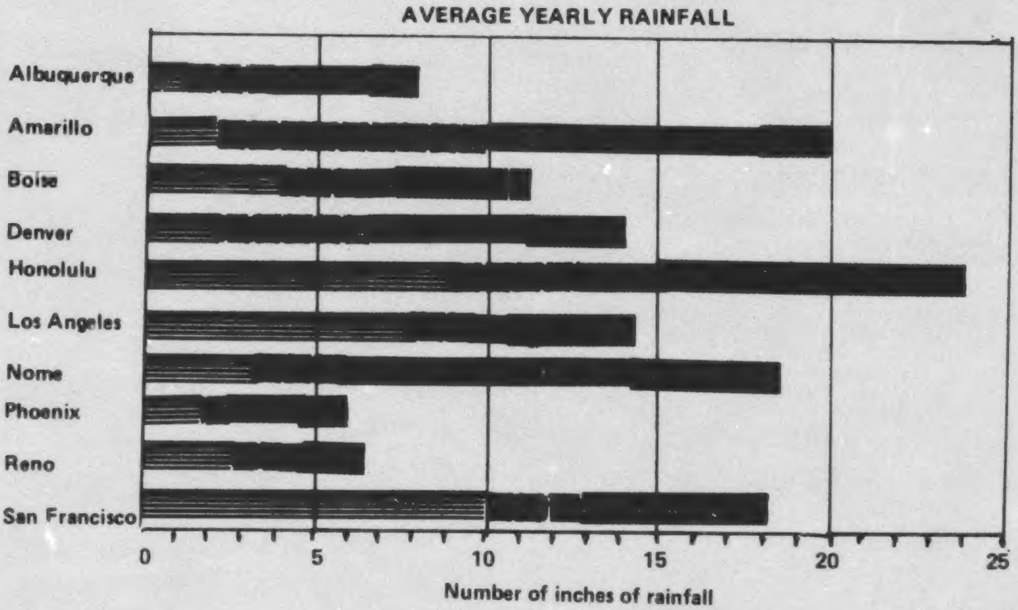
D) 8 has no reciprocal

d = 13.490

1030 Reading bar graphs (identifying data).

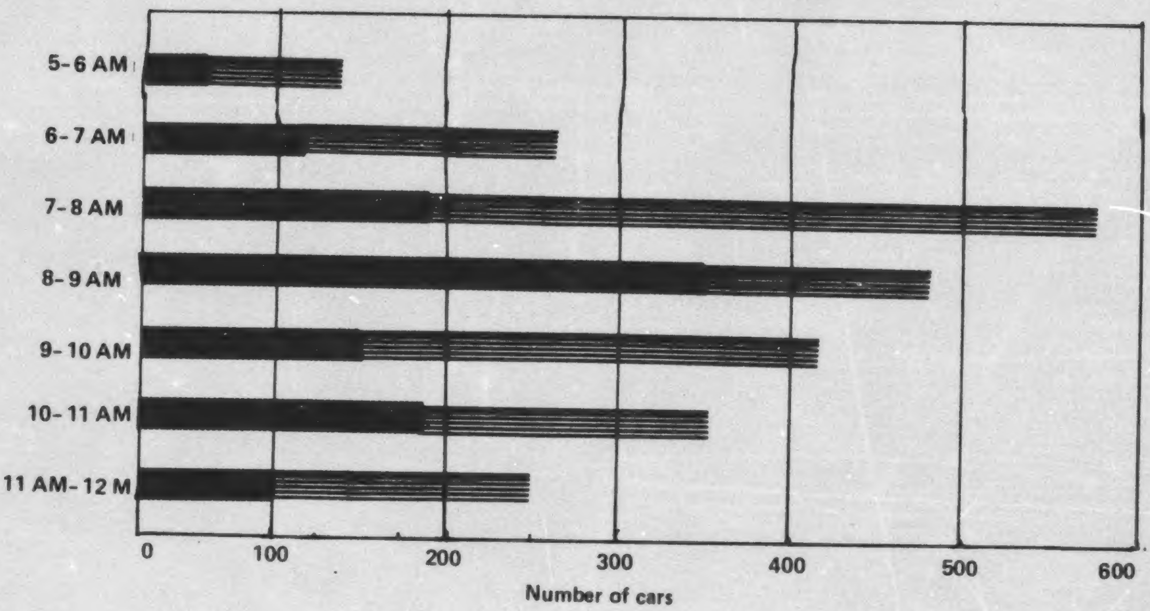
The learner will identify data from a given bar graph.

Directions: Select the best answer to complete the statement for the graph given.



1. ? cities have a yearly average of less than 15 inches of rain.
   - A) six
   - B) five
   - C) four
   - D) three

MORNING TRAFFIC ON MAIN STREET



LEGEND

Cars going east ■

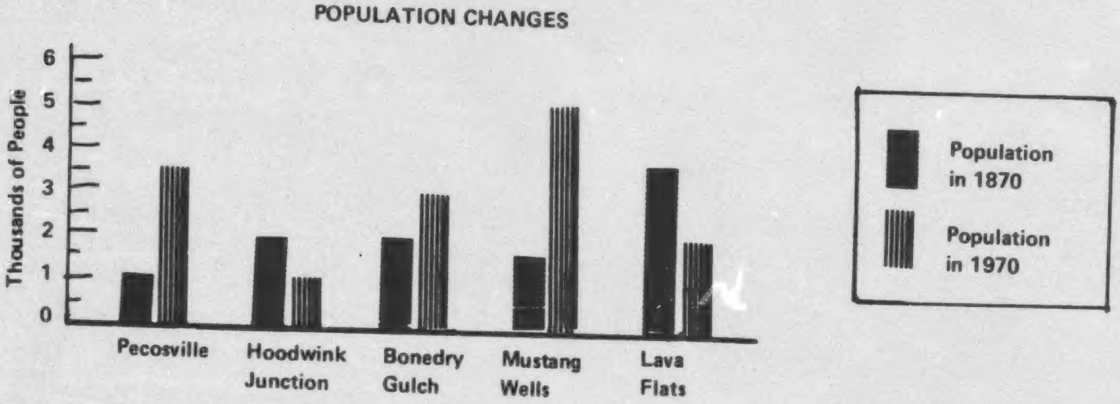
Cars going west ▤

2. At least 400 cars traveled on Main Street during $\boxed{?}$ different hours.
   - A) two
   - B) three
   - C) four
   - D) five

1030 (continued)

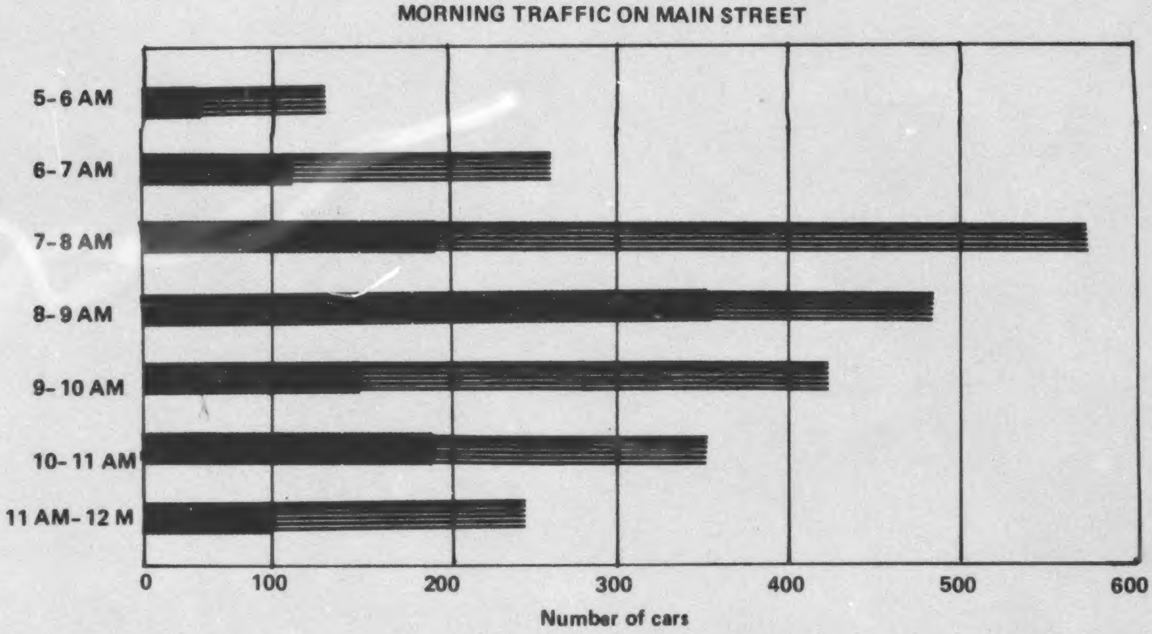
JOHN VOTES	BESS VOTES	TOM VOTES	MARY VOTES
40%	25%	20%	15%

3. 60 votes were cast. Tom got $\boxed{?}$ votes.
   A) 9 votes
   B) 12 votes
   C) 15 votes
   D) 24 votes



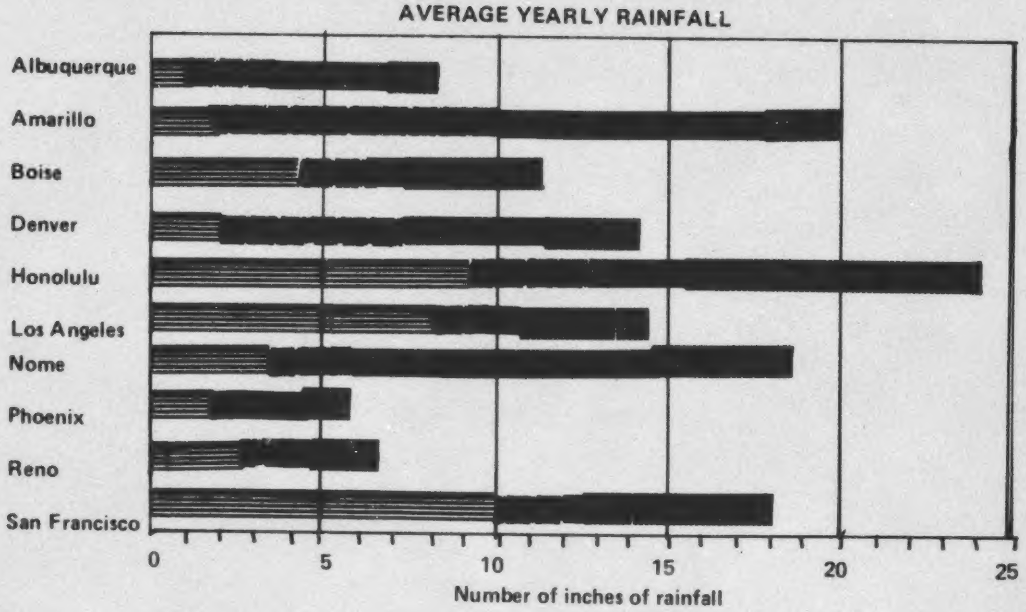
4. $\boxed{?}$ had a decrease in its population of 1500 people between 1870 and 1970.
   A) Hoodwink Junction
   B) Bonedry Gulch
   C) Mustang Wells
   D) Lava Flats

1030 (continued)



5. At least 150 cars traveled east during ? different hours.
   A) two
   B) five
   C) six
   D) four

1030 (continued)



6. ? gets about one-third as much rain each year as Honolulu.
   A) Reno
   B) Phoenix
   C) Albuquerque
   D) Denver

LEGEND

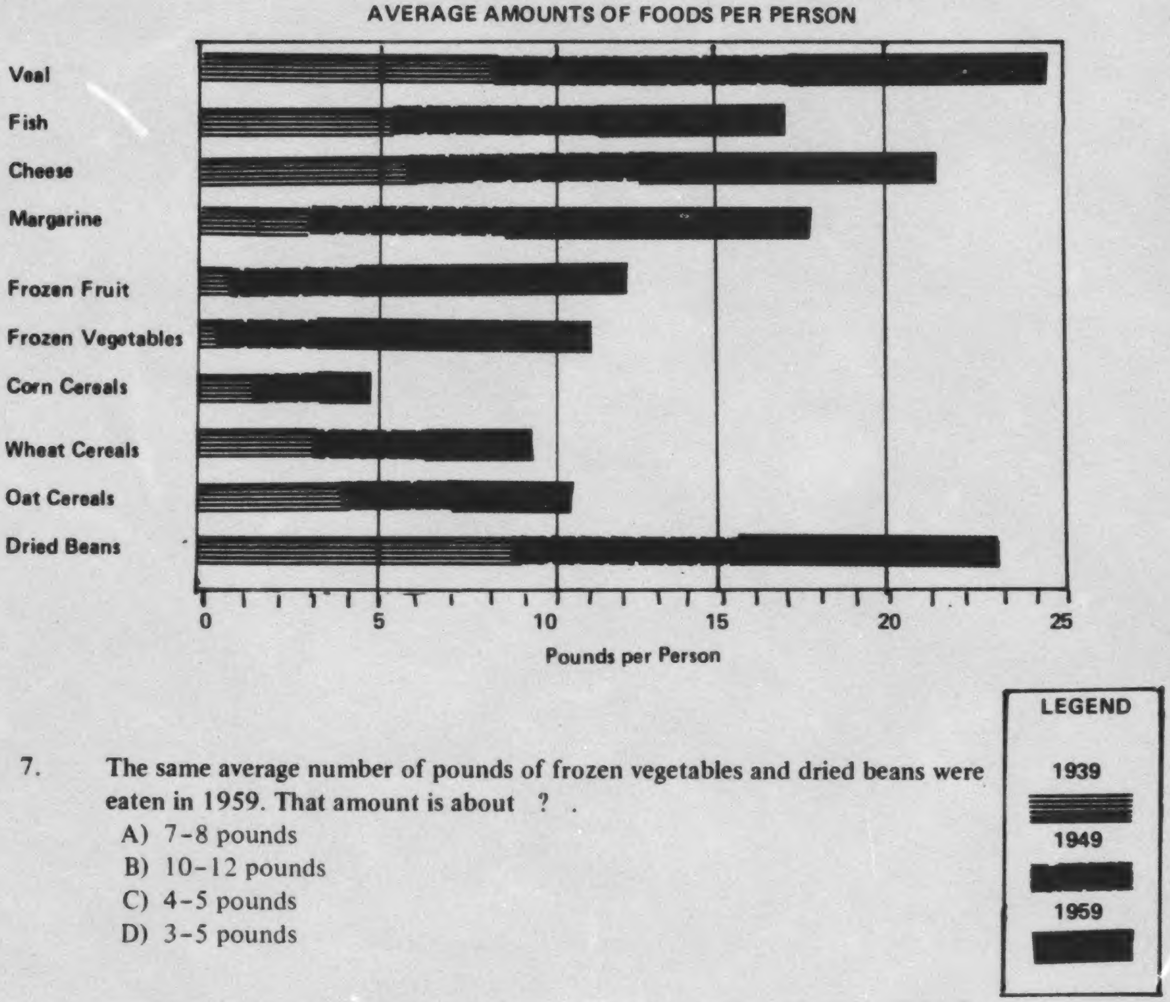
Jan., Feb., Mar. ▤

Apr., May, June ▩

July, Aug., Sept. ■

Oct., Nov., Dec. ■

1030 (continued)



7. The same average number of pounds of frozen vegetables and dried beans were eaten in 1959. That amount is about ? .
   - A) 7-8 pounds
   - B) 10-12 pounds
   - C) 4-5 pounds
   - D) 3-5 pounds

d = 13.595

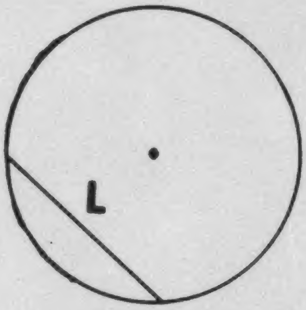
1040 Identifying parts of a circle.

The learner will identify the following parts of a circle: center, radius, diameter and chord.

Directions: Choose the correct name for the illustrated part.

1.

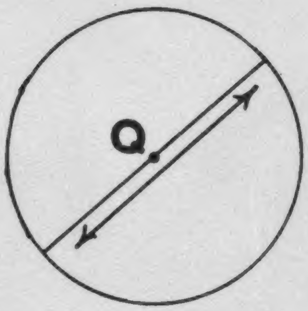
A) center
B) radius
C) diameter
D) chord



L = ?

2.

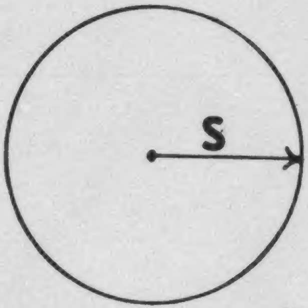
A) center
B) radius
C) diameter
D) chord



Q = ?

3.

A) center
B) radius
C) diameter
D) chord

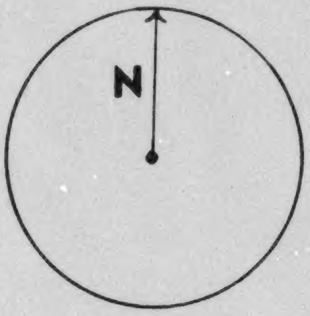


S = ?

1040 (continued)

4.

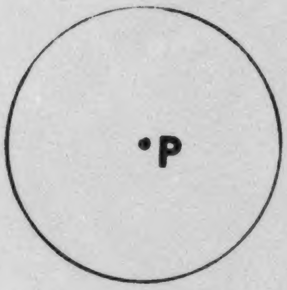
A) center
B) radius
C) diameter
D) chord



N = ?

5.

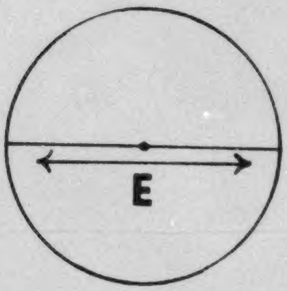
A) center
B) radius
C) diameter
D) chord



P = ?

6.

A) center
B) radius
C) diameter
D) chord



E = ?

d = 13.610

1050 Dividing whole numbers by fractions or mixed numbers or vice-versa.

The learner will divide a whole number by a fraction or a mixed number or divide a fraction or mixed number by a whole number.

Directions: Select the answer that is the quotient for the incomplete equation and is in simplest terms.

1. $\frac{1}{3} \div 8 =$

   A) $\frac{1}{24}$

   B) $\frac{8}{3}$

   C) $\frac{3}{8}$

   D) $2\frac{2}{3}$

2. $3\frac{1}{4} \div 6 =$

   A) $\frac{13}{24}$

   B) $19\frac{1}{2}$

   C) $\frac{24}{13}$

   D) $\frac{4}{78}$

3. $2\frac{3}{4} \div 7 =$

   A) $19\frac{1}{4}$

   B) $\frac{11}{28}$

   C) $\frac{28}{11}$

   D) $\frac{4}{77}$

4. $4\frac{2}{3} \div 5 =$

   A) $23\frac{1}{3}$

   B) $\frac{15}{14}$

   C) $\frac{3}{70}$

   D) $\frac{14}{15}$

1050 (continued)

5. $\frac{2}{3} \div 7 =$

A) $\frac{21}{2}$

B) $\frac{2}{21}$

C) $\frac{14}{3}$

D) $4\frac{2}{3}$

6. $\frac{1}{4} \div 5 =$

A) $\frac{4}{5}$

B) $1\frac{1}{4}$

C) $\frac{5}{4}$

D) $\frac{1}{20}$

7. $\frac{3}{4} \div 9 =$

A) $\frac{1}{12}$

B) $\frac{27}{4}$

C) $6\frac{3}{4}$

D) $\frac{3}{36}$

8. $\frac{2}{5} \div 6 =$

A) $\frac{12}{5}$

B) $2\frac{2}{5}$

C) $\frac{1}{15}$

D) $\frac{2}{30}$

d = 13.645

1060 Identifying fractions, decimals and percents.

Given fractions whose denominators are factors of 100, the learner will determine the fraction for each with a denominator of 100, the decimal and the percent.

Directions: Select the answer that expresses the given number as a fraction with a denominator of 100, in decimal notation, and as a percent.

1. $\frac{4}{5} =$

A) $\frac{80}{100}$, .80, 80%

B) 8000, 80, 80%

C) $\frac{100}{80}$, .80, 80%

D) $\frac{80}{100}$, 80, .80%

2. $\frac{13}{20} =$

A) $\frac{65}{100}$, .65, 65%

B) $\frac{100}{65}$, .65, 65%

C) 6500, 65, 65%

D) $\frac{65}{100}$, .65, .65%

3. $\frac{19}{10} =$

A) 1900, 190, .190%

B) $\frac{100}{190}$, .190, 190%

C) $\frac{190}{100}$, 1.90, 190%

D) $\frac{190}{100}$, 1.90, 1.90%

4. $\frac{35}{20} =$

A) $\frac{175}{100}$, .175, 175%

B) $\frac{175}{100}$, 1.75, 175%

C) $\frac{100}{175}$, 17.5, 1.75%

D) 17500, 175, 175%

5. $\frac{27}{25} =$

A) $\frac{108}{100}$, 1.08, 108%

B) 10800, 108, 108%

C) $\frac{100}{108}$, 1.08, .108%

D) $\frac{108}{100}$, 1.08, 1.08%

6. $\frac{61}{50} =$

A) $\frac{122}{100}$, 1.22, 1.22%

B) $\frac{100}{122}$, .122, 122%

C) $\frac{122}{100}$, 1.22, 122%

D) 12200, 122, 122%

7. $\frac{3}{20} =$

A) $\frac{15}{100}$, .15, .15%

B) $\frac{100}{15}$, .15, 15%

C) 1500, 15, 15%

D) $\frac{15}{100}$, .15, 15%

8. $\frac{17}{5} =$

A) $\frac{340}{100}$, 3.40, 3.40%

B) $\frac{340}{100}$, .340, 340%

C) 34000, 340, 3.40%

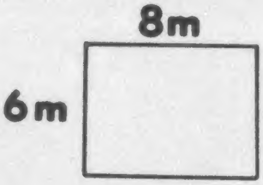
D) $\frac{340}{100}$, 3.40, 340%

d = 13.920

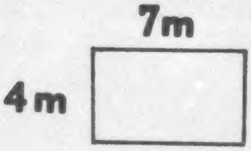
1070 Determining the area of a rectangle.

The learner will find the area of a rectangular region when given the lengths of the sides.

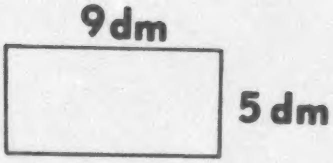
1. **The area of the figure is**
   - A) 14 meters
   - B) 28 m^2
   - C) 2464 m^2
   - D) 48 m^2



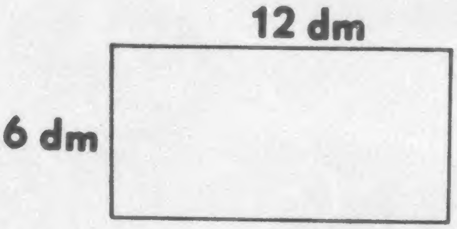
2. **The area of the figure is**
   - A) 11 m
   - B) 22 m
   - C) 784 m^2
   - D) 28 m^2



3. **The area of the figure is**
   - A) 14 dm
   - B) 28 dm
   - C) 45 dm^2
   - D) 2025 dm^2

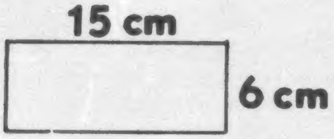


4. **The area of the figure is**
   - A) 18 dm
   - B) 36 dm
   - C) 72 dm^2
   - D) 5180 dm^2

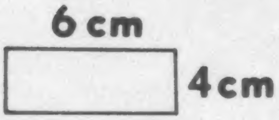


1070 (continued)

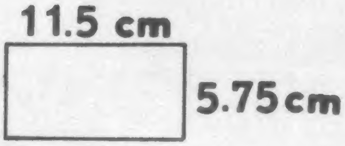
5. **The area of the figure is**
   - A) 90 cm^2
   - B) 8100 cm^2
   - C) 42 cm
   - D) 21 cm



6. **The area of the figure is**
   - A) 32 cm^2
   - B) 1024 cm^2
   - C) 24 cm
   - D) 12 cm



7. **The area of the figure is**
   - A) 17.25 cm^2
   - B) 34.50 cm
   - C) 4372.53 cm^2
   - D) 66.125 cm^2


11.5 cm
5.75cm

d = 14.115

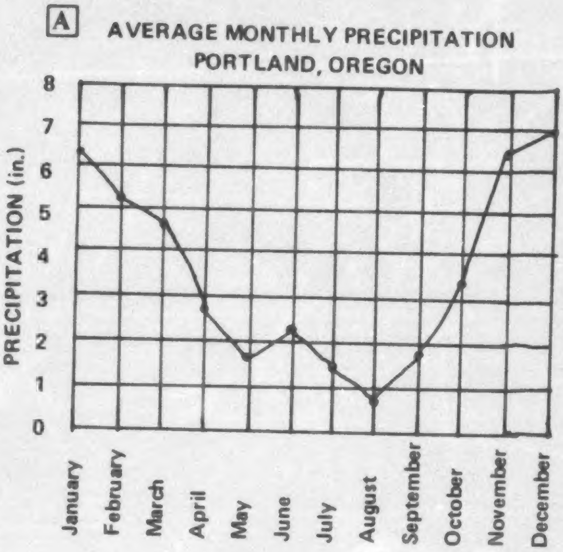
1080 Reading line graphs.

The learner will identify data from a given line graph.

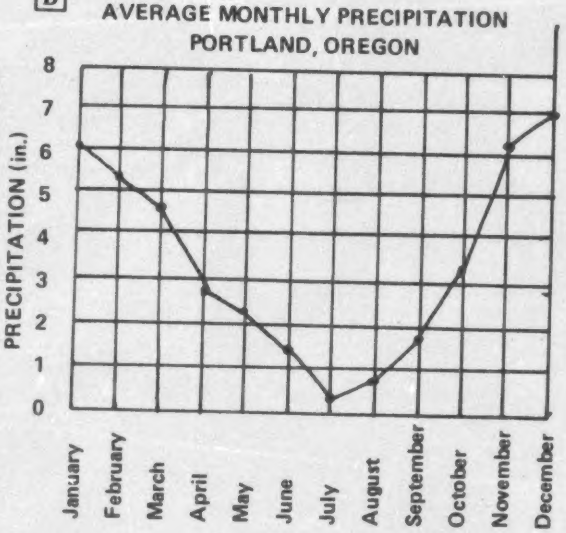
Directions: Select the correct graph for the data given.

1. **The average rainfall for each month was less than 2 inches in June, July, August, and September.**
   A) A
   B) B
   C) C

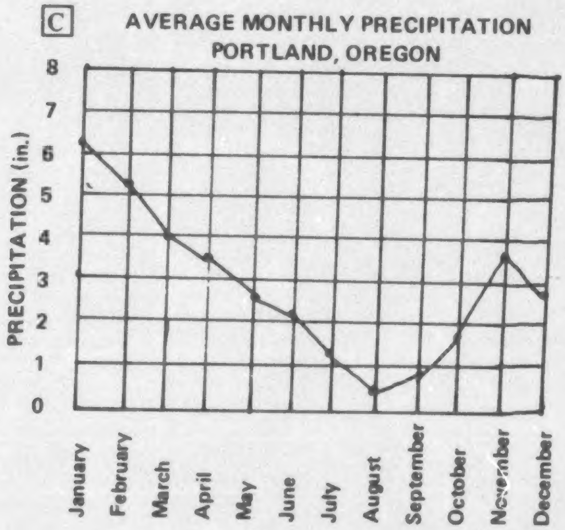
A



B



C

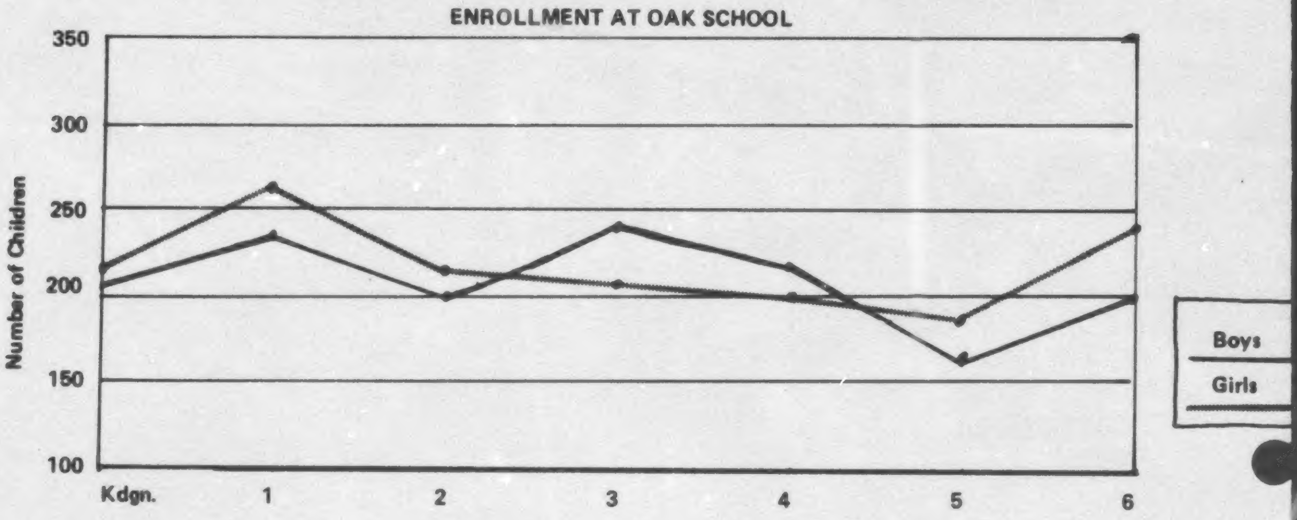


1080 (continued)

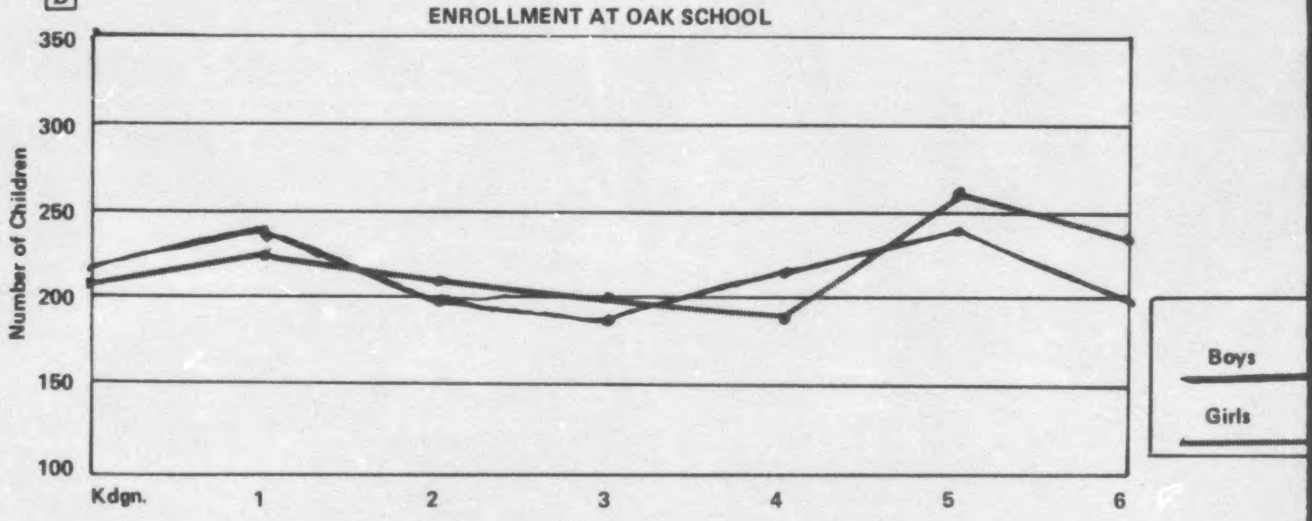
Directions: Select the correct graph for the data given.

2. More boys than girls are enrolled in only grades 3 and 4.
   - A) A
   - B) B
   - C) C

A



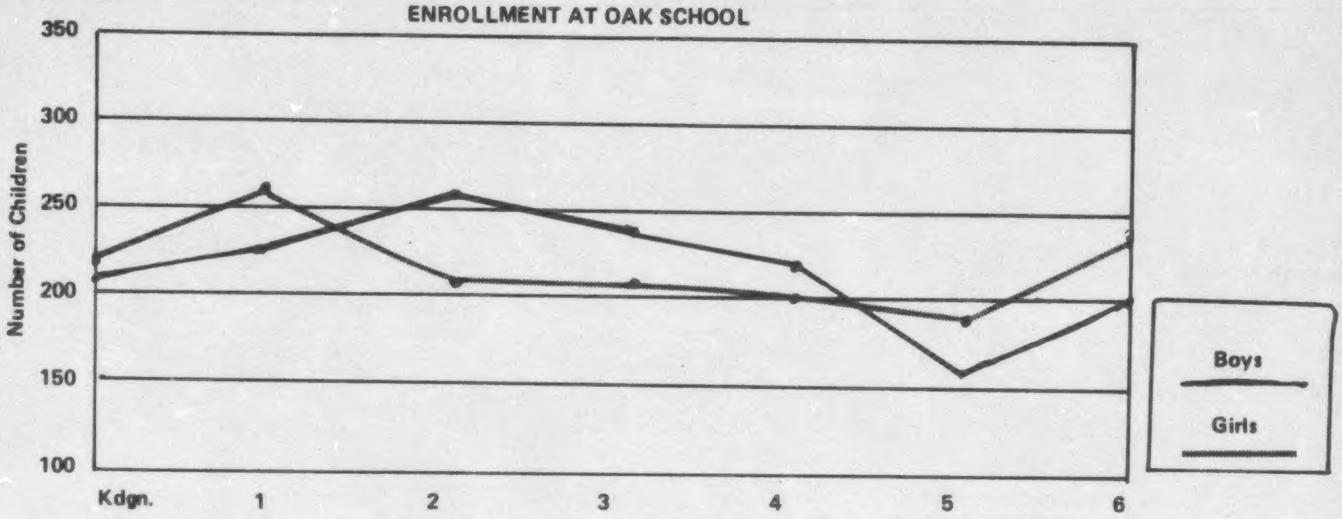
B



1080 (continued)

2. (continued)

C



1080 (continued)

Directions: Select the correct graph for the data given.

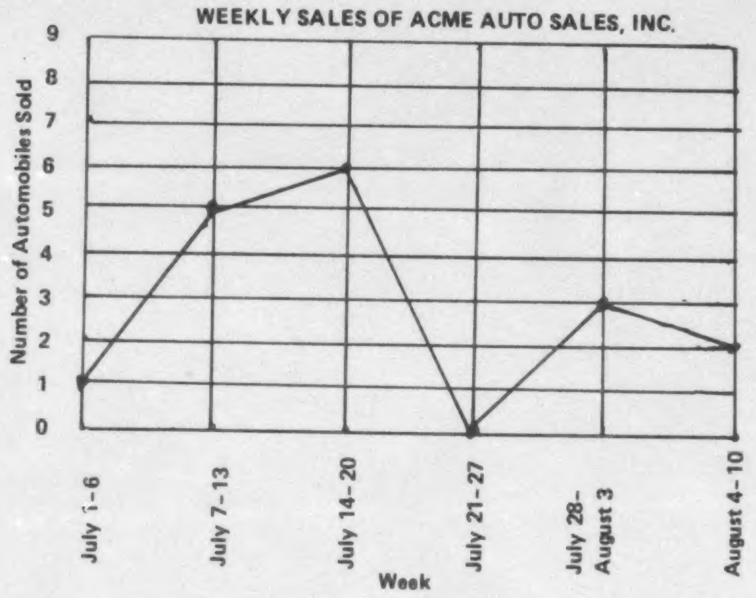
3. Which graph shows that the ***greatest increase*** in sales from one week to the next was 5?

   A) A

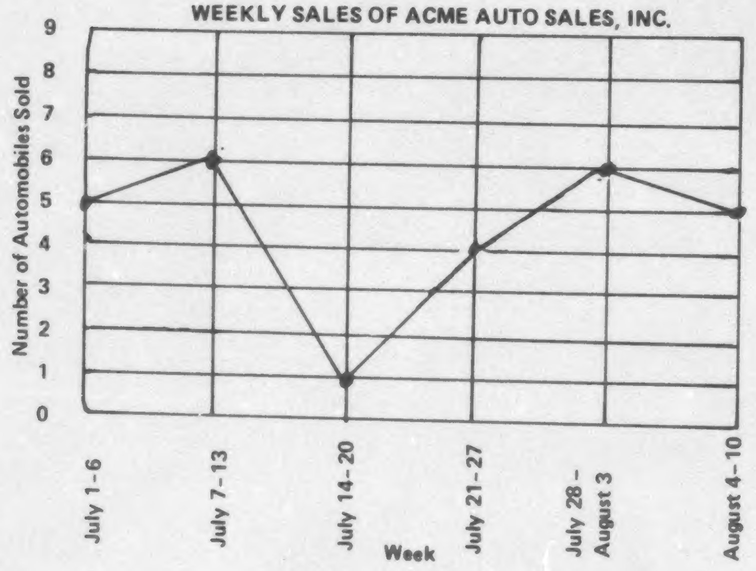
   B) B

   C) C

A



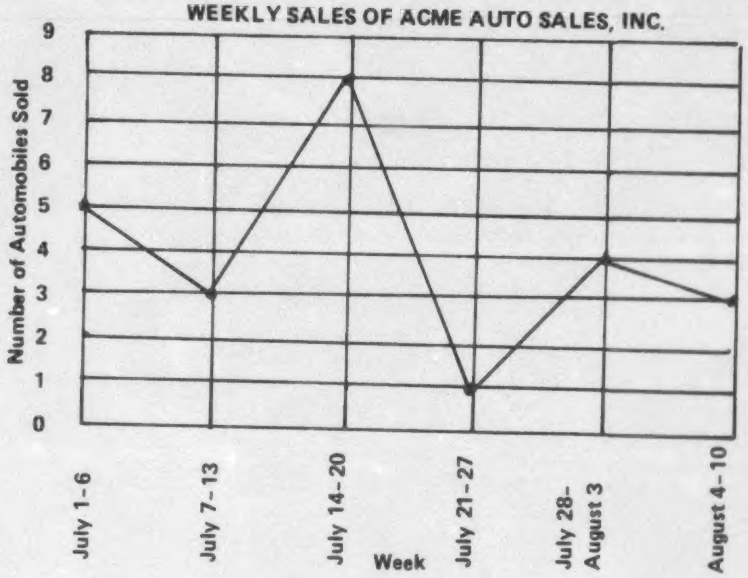
B



1080 (continued)

3. (continued)

C



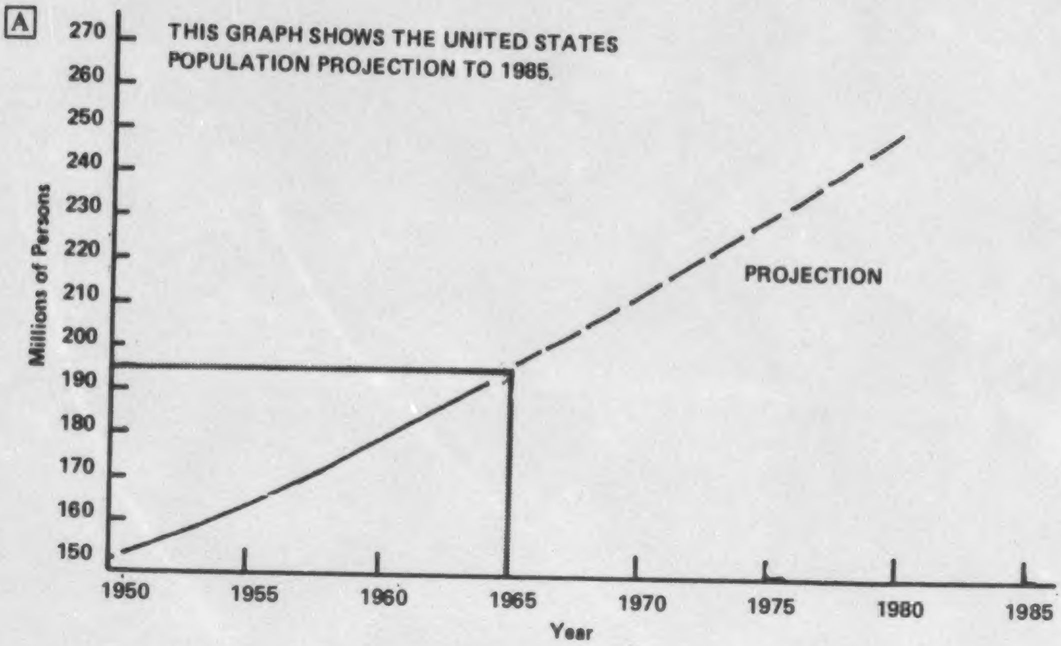
1080 (continued)

Directions: Select the correct graph for the data given.

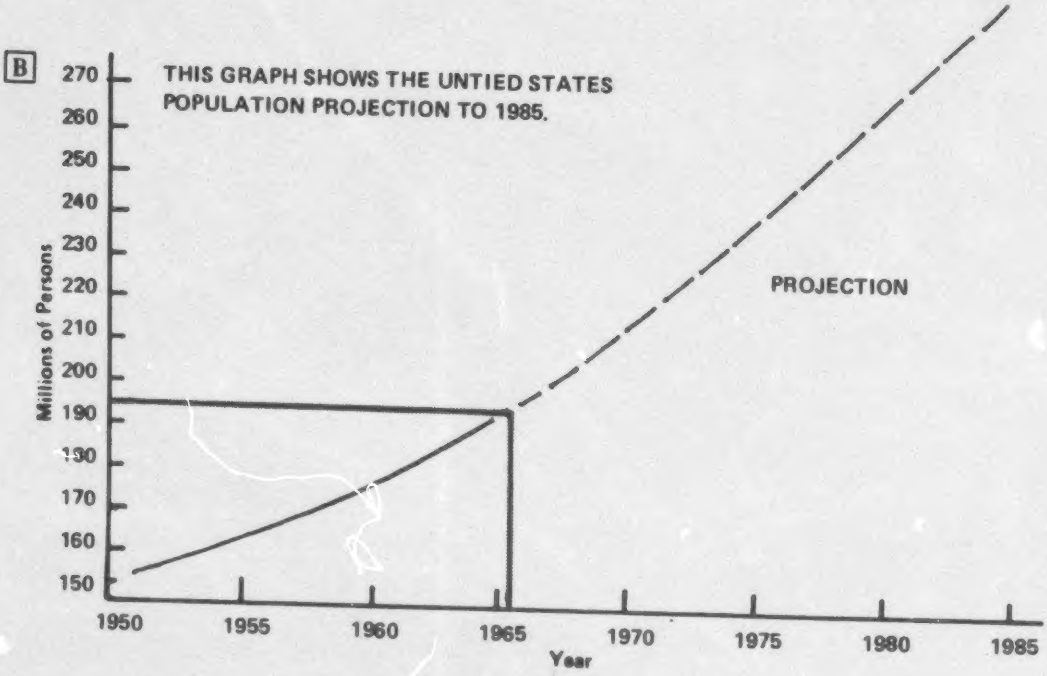
4. **The population projection for 1980 is 250 million.**

A) A
B) B
C) C

A



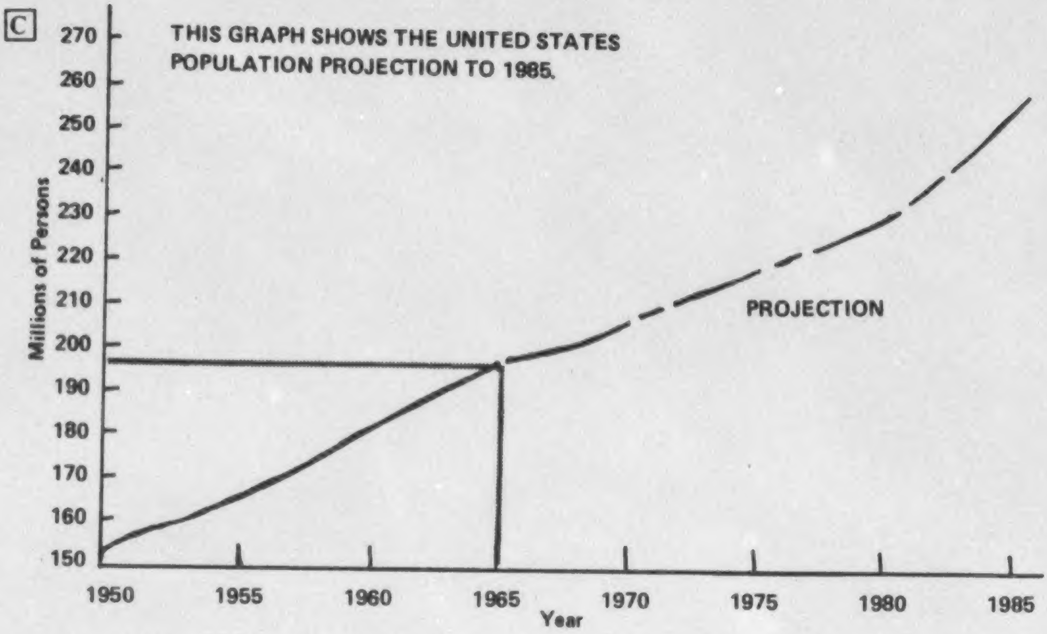
B



1080 (continued)

4. (continued)

C

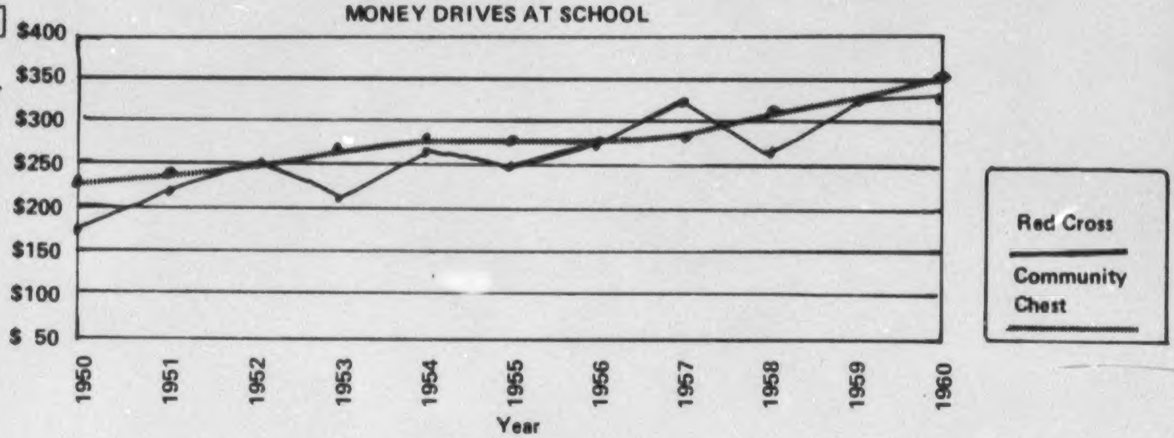


1080 (continued)

Directions: Select the correct graph for the data given.

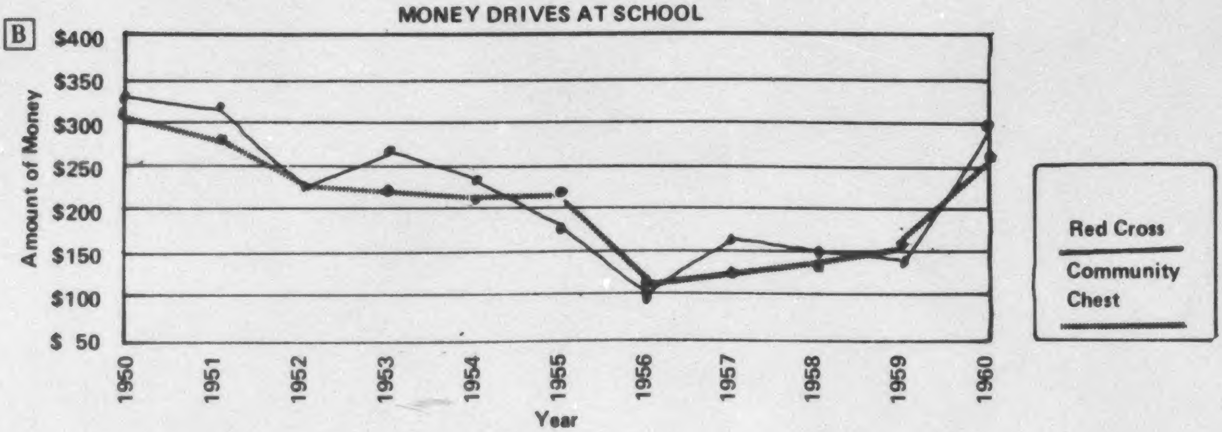
5. **The same amount of money was collected for the Red Cross as was collected for the Community Chest in only 1956 and 1959.**
   - A) A
   - B) B
   - C) C

A



MONEY DRIVES AT SCHOOL

B

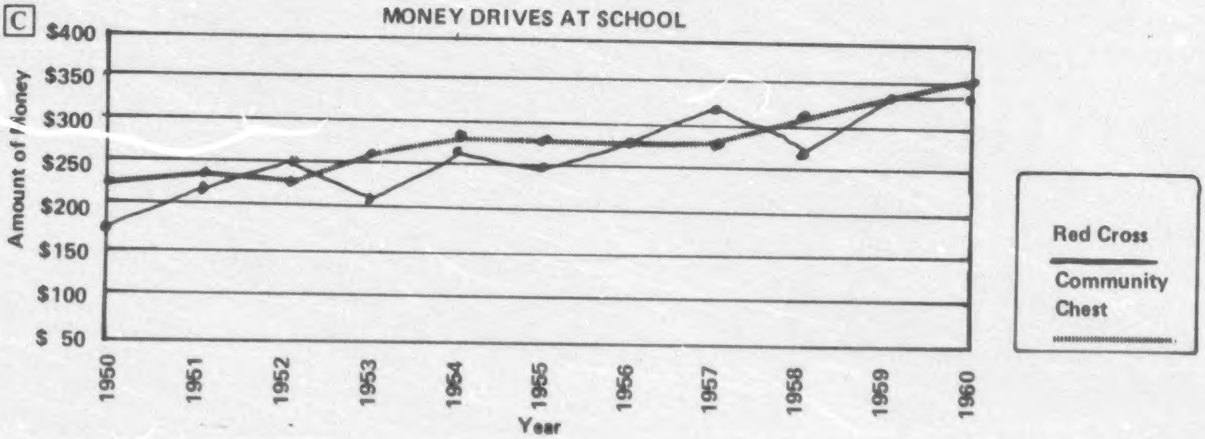


MONEY DRIVES AT SCHOOL

1080 (continued)

5. (continued)

C



d = 14.125

1090 Identifying decimals for fractions.

The learner will express fractional numerals of the form $\frac{a}{b}$ where $a < b$ as decimals. The solution will not exceed three places to the right of the decimal point.

Directions: Find the decimal fraction equivalent to the common fraction.

1. $\frac{6}{10} =$

A) 60.
B) 6.0
C) .06
D) .6

2. $\frac{8}{10} =$

A) .08
B) .18
C) .8
D) 8.0

3. $\frac{6}{20} =$

A) .03
B) 3.5
C) .5
D) .3

4. $\frac{3}{4} =$

A) .75
B) .34
C) .7
D) .25

5. $\frac{1}{4} =$

A) .14
B) .025
C) .25
D) .4

6. $\frac{10}{20} =$

A) .5
B) .05
C) .20
D) .10

d = 14.170

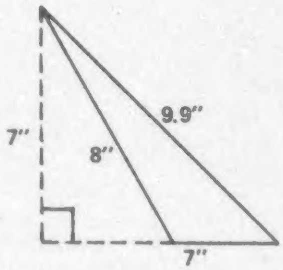
1100 Determining the area of a triangle.

Given the formula $A\Delta = \frac{bh}{2}$ for finding the area of a triangle, and the measures of the base and the height, the learner will find the area.

Directions: Select the answer for the problem.

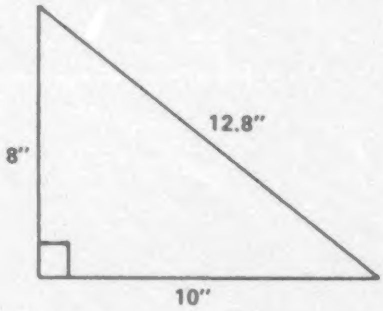
1. Find the area. $A = \frac{bh}{2} =$

A) 24 1/2 sq. inches
B) 56 sq. inches
C) 72 sq. inches



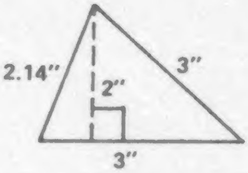
2. Find the area. $A = \frac{bh}{2} =$

A) 120 sq. inches
B) 40 sq. inches
C) 30 sq. inches



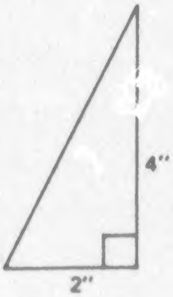
3. Find the area. $A = \frac{bh}{2} =$

A) 15 sq. inches
B) 3 sq. inches
C) 9 sq. inches



4. Find the area. $A = \frac{bh}{2} =$

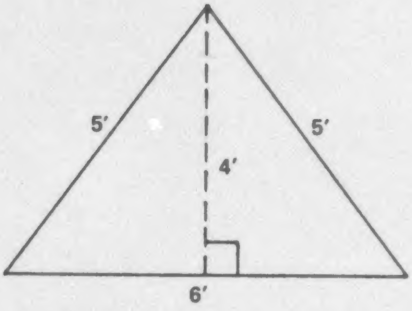
A) 10 sq. inches
B) 20 sq. inches
C) 4 sq. inches



1100 (continued)

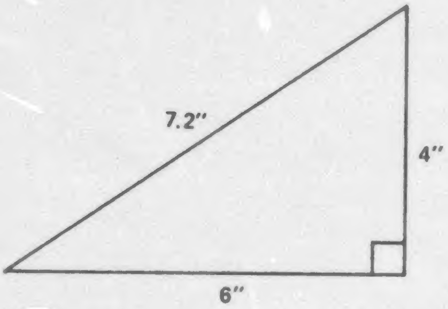
5. Find the area. $A = \frac{bh}{2} =$

A) 30 sq. feet
B) 16 sq. feet
C) 12 sq. feet



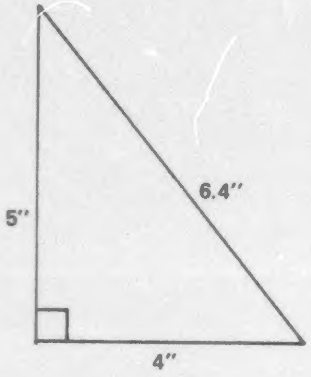
6. Find the area. $A = \frac{bh}{2} =$

A) 12 sq. inches
B) 48 sq. inches
C) 18 sq. inches



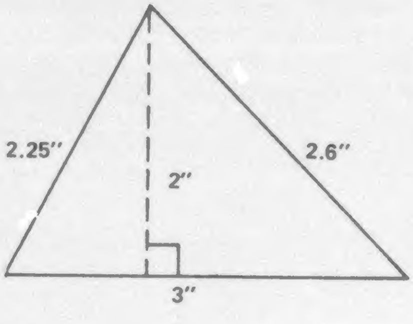
7. Find the area. $A = \frac{bh}{2} =$

A) 15 sq. inches
B) 10 sq. inches
C) 24 sq. inches



8. Find the area. $A = \frac{bh}{2} =$

A) 3 sq. inches
B) 15 sq. inches
C) 12 sq. inches



d = 14.260

1110 Dividing fractions and mixed numbers.

The learner will divide a fraction by a fraction or a mixed number by a fraction or mixed number. The learner will be able to express the correct answer in simplest terms.

Directions: Select the correct answer for the incomplete equation and express the answer in *simplest* terms.

1. $3\frac{3}{4} \div \frac{3}{4} =$

A) $\frac{1}{5}$

B) $2\frac{13}{16}$

C) $3\frac{9}{16}$

D) 5

2. $3\frac{3}{4} \div 2\frac{1}{5} =$

A) $1\frac{31}{44}$

B) $\frac{75}{44}$

C) $\frac{44}{75}$

D) $8\frac{1}{4}$

3. $3\frac{2}{5} \div \frac{1}{4} =$

A) $\frac{68}{5}$

B) $13\frac{3}{5}$

C) $\frac{5}{68}$

D) $\frac{17}{20}$

4. $\frac{7}{8} \div \frac{2}{3} =$

A) $\frac{7}{12}$

B) $1\frac{5}{16}$

C) $\frac{21}{16}$

D) $\frac{14}{24}$

1110 (continued)

5. $\frac{1}{2} \div \frac{3}{8} =$

A) $1\frac{1}{3}$

B) $\frac{3}{16}$

C) $\frac{8}{6}$

D) $1\frac{2}{6}$

6. $1\frac{3}{5} \div 4\frac{2}{3} =$

A) $\frac{24}{70}$

B) $2\frac{11}{12}$

C) $\frac{12}{35}$

D) $7\frac{7}{15}$

7. $\frac{5}{6} \div \frac{3}{4} =$

A) $\frac{20}{18}$

B) $\frac{5}{8}$

C) $1\frac{2}{18}$

D) $1\frac{1}{9}$

d = 14.305

1120 Identifying decimal equivalents for common fractions.

The student will be able to identify the repeating or terminating decimal equivalent to a common fraction with a one-digit numerator and denominator.

Directions: Select the decimal that is equivalent to the common fraction given.

1. $\frac{3}{4} =$

A) .75
B) .34
C) .7
D) .25

2. $\frac{1}{3} =$

A) $.\overline{333}$
B) $1.\overline{333}$
C) $.1\overline{333}$
D) .0333

3. $\frac{1}{5} =$

A) .5
B) .15
C) 1.5
D) .2

4. $\frac{5}{8} =$

A) .58
B) 1.3
C) .[illegible]
D) .625

5. $\frac{5}{9} =$

A) 1.8000
B) $.\overline{555}$
C) $1.\overline{888}$
D) $5.\overline{555}$

6. $\frac{5}{6} =$

A) $5.\overline{666}$
B) 1.2000
C) $8.\overline{333}$
D) $.8\overline{333}$

7. $\frac{1}{9} =$

A) $.\overline{111}$
B) $1.\overline{999}$
C) $.\overline{999}$
D) $1.\overline{111}$

8. $\frac{1}{6} =$

A) $1.\overline{666}$
B) $.\overline{666}$
C) $.1\overline{666}$
D) $6.\overline{666}$

d = 14.320

1130 Dividing a whole number by a decimal fraction.

The learner will determine the quotient for division of a whole number by a decimal fraction not to exceed three digits.

Directions: Select the quotient for the problem.

1. $83.2\overline{)4992}$
   - A) .06
   - B) 60.
   - C) 6.
   - D) .6

2. $6.4\overline{)384}$
   - A) .60
   - B) 60.
   - C) 6.
   - D) .06

3. $23.8\overline{)3808}$
   - A) 160.
   - B) .16
   - C) 16.
   - D) .016

4. $.36\overline{)504}$
   - A) 140.
   - B) 1.4
   - C) 14.
   - D) 1400.

5. $3.28\overline{)4592}$
   - A) .14
   - B) 14.
   - C) 1400.
   - D) 140.

6. $8.23\overline{)6584}$
   - A) .8
   - B) 8.
   - C) 80.
   - D) 800.

7. $.624\overline{)3744}$
   - A) 60.
   - B) 6000.
   - C) 6.
   - D) .6

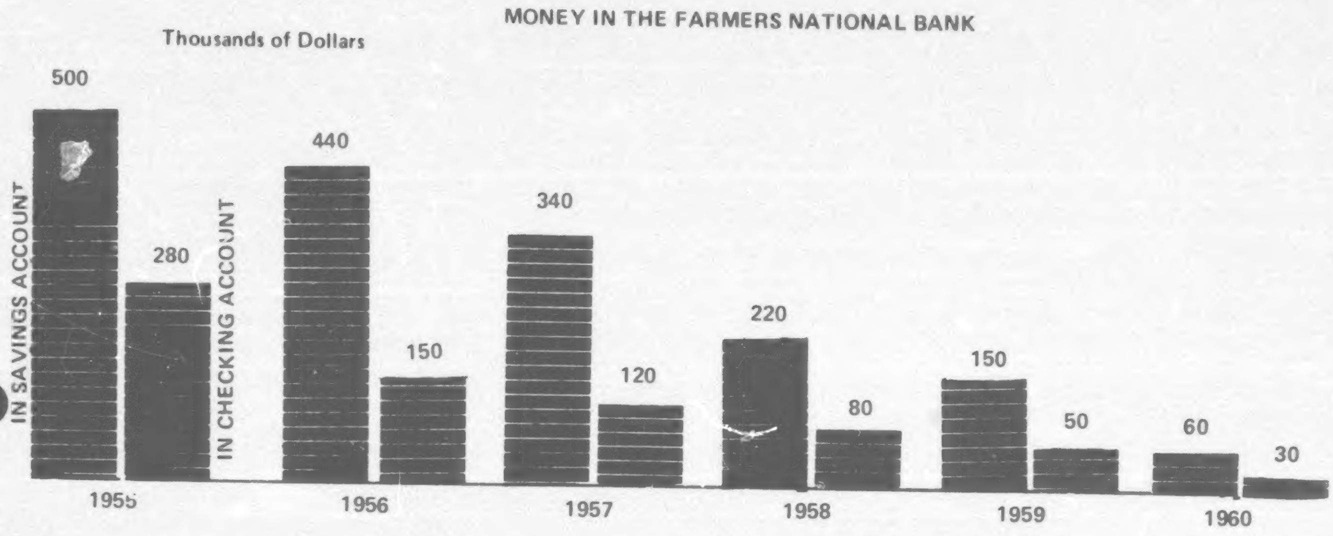
8. $.426\overline{)5538}$
   - A) 13000.
   - B) 1.300
   - C) 130.
   - D) 13.

d = 14.420

1140 Reading picture graphs (identifying data).

The learner will identify data from a given picture graph.

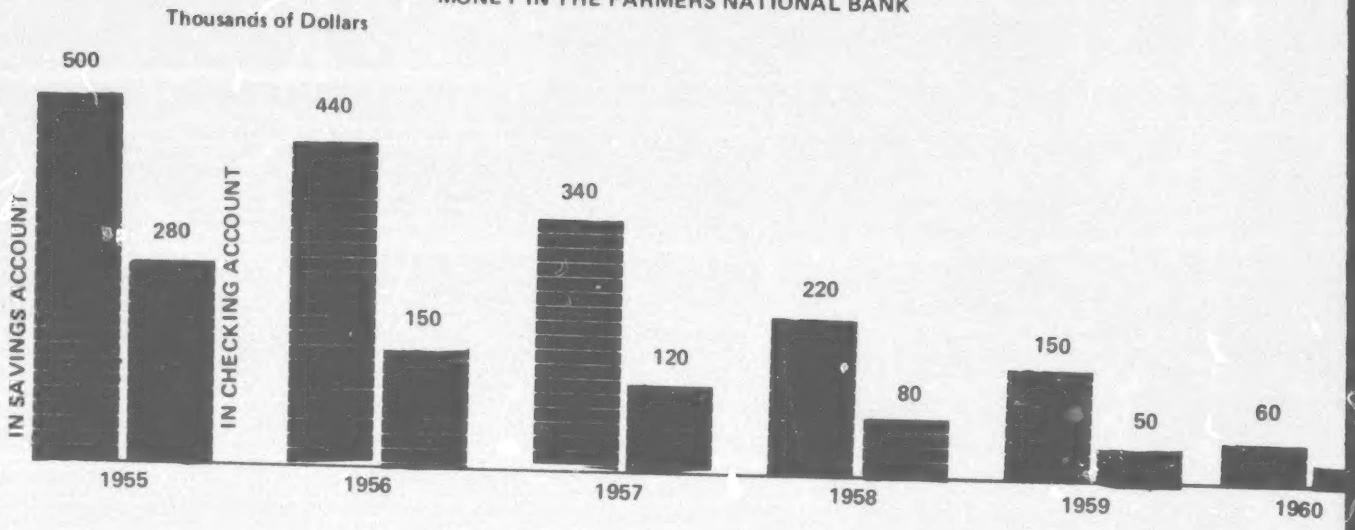
Directions: Select the best answer to complete the statement for the given graph.



1. In $\boxed{?}$ there was three times as much money in savings accounts as in checking accounts.
   - A) 1955
   - B) 1958
   - C) 1959
   - D) 1960

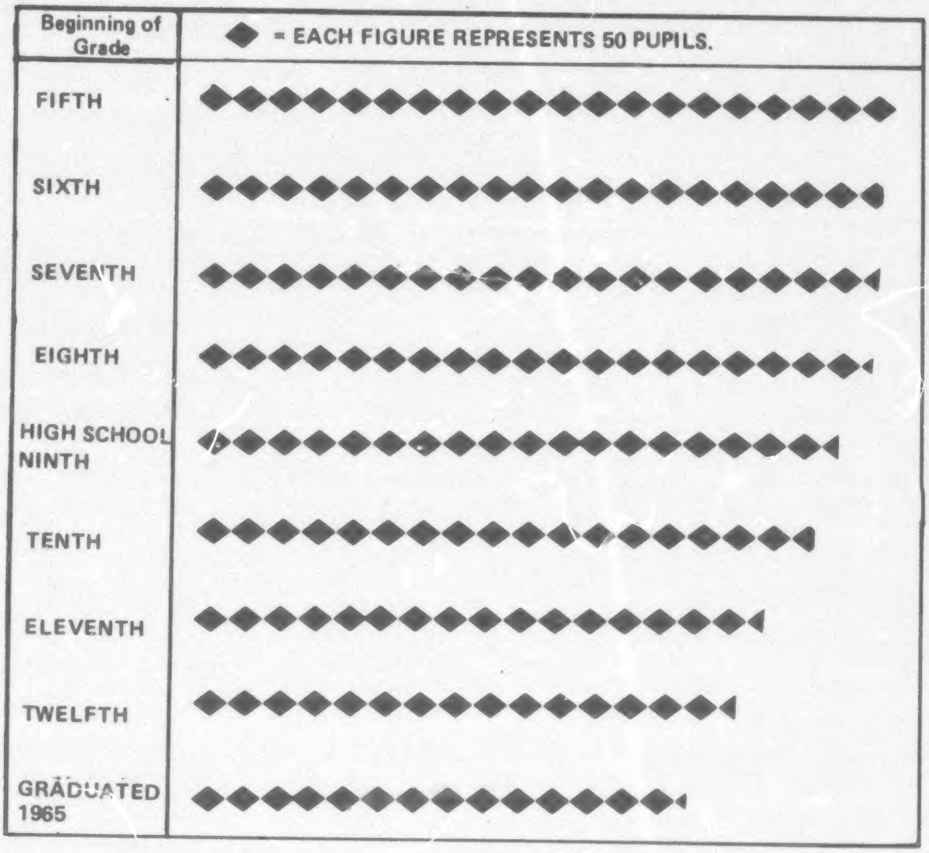
1140 (continued)

MONEY IN THE FARMERS NATIONAL BANK



2. There was $\boxed{?}$ less in checking accounts in 1960 than there was in 1955.
   A) 250 ten thousands of dollars
   B) $250,000
   C) 2.5 thousands of dollars
   D) 25 thousands of dollars

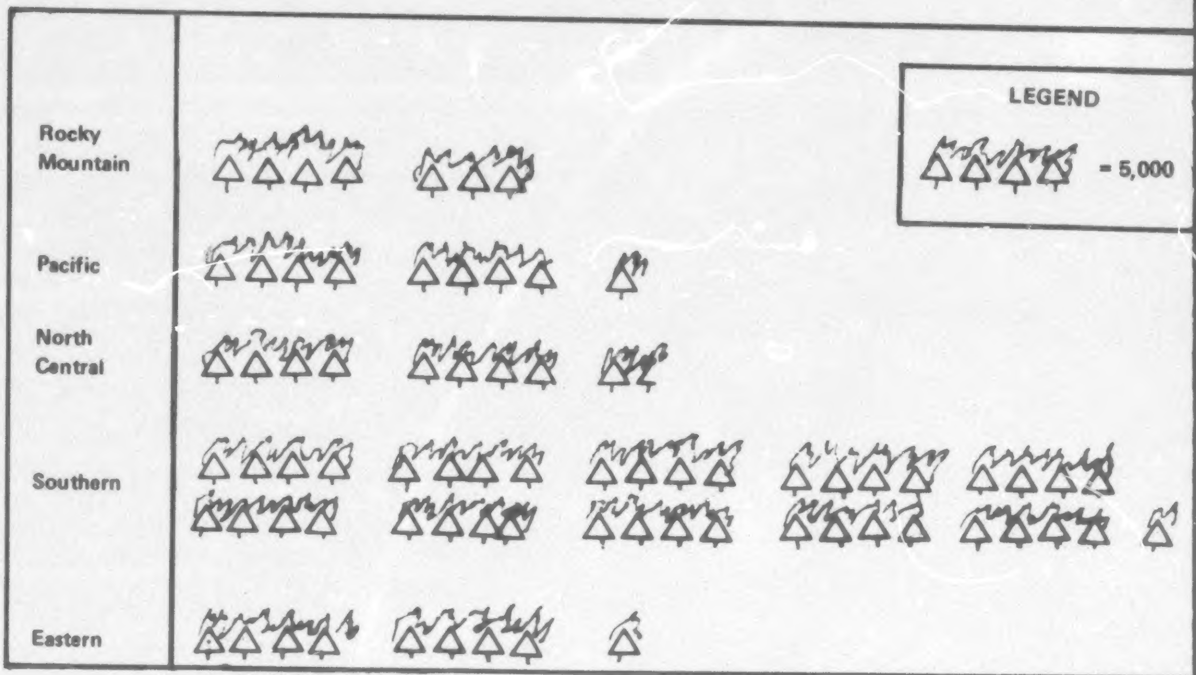
NUMBER OF PUPILS REMAINING IN SCHOOL PER 1000 PUPILS*



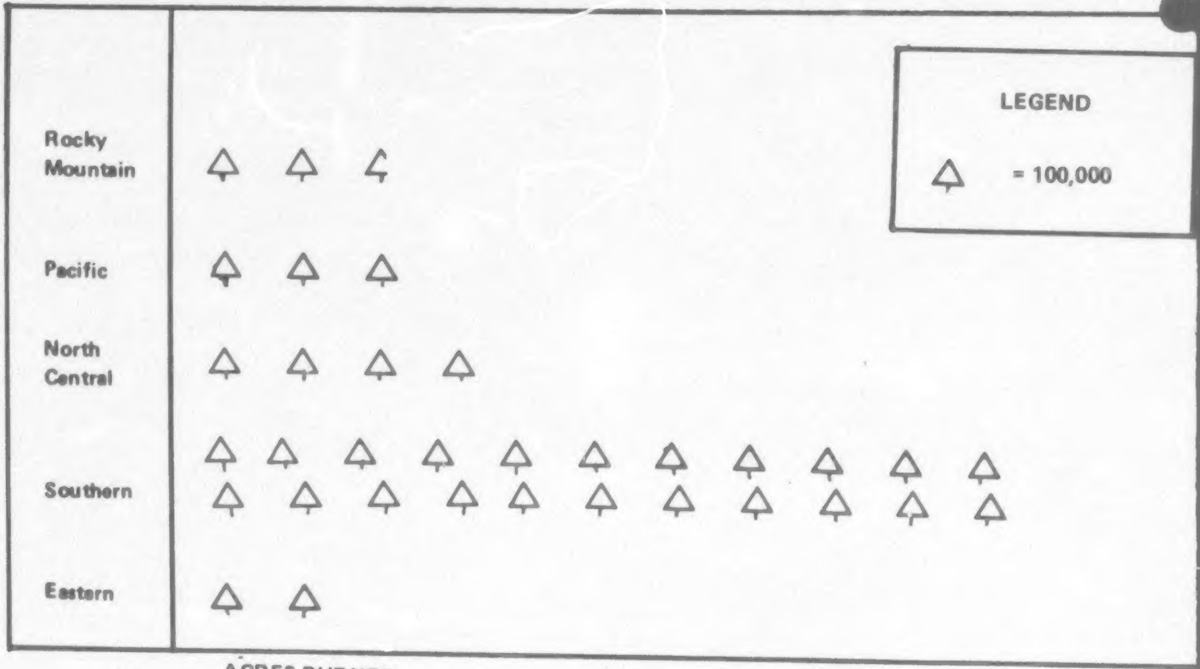
*Of each 1000 pupils who entered fifth grade in 1957.

3. How many pupils (per 1000) dropped out before high school graduation?
   - A) 55 thousand pupils
   - B) 290 pupils
   - C) 5500 pupils
   - D) 5.5 thousand pupils

1140 (continued)



NUMBER OF FIRES



ACRES BURNED

4. Nearly the same number of acres burned in the Rocky Mountains and Pacific regions, but the Pacific region had about $\boxed{?}$ more fires.

A) 2500 more fires
B) 250,000 more fires
C) 2.5 hundreds more fires
D) 4,000 more fires

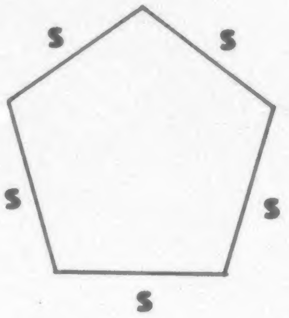
d = 14.810

1150 Using the perimeter formula.

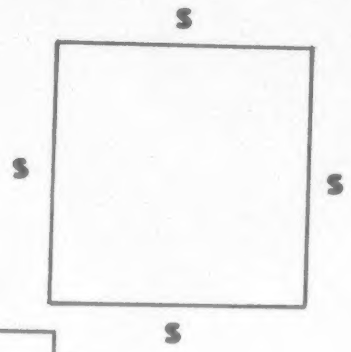
Given the dimensions of any polygon and the perimeter formula, the learner will find the perimeter of the polygon.

Directions: Select the answer that names the perimeter formula for the polygon shown and the perimeter of the polygon.

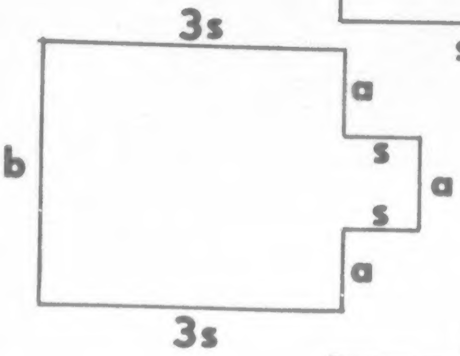
1. S = 9 dm
   A) P = s + s; 18 dm
   B) P = s × s; 81 dm^2
   C) P = 5s; 45 dm
   D) P = 5 × s; 45 dm^2



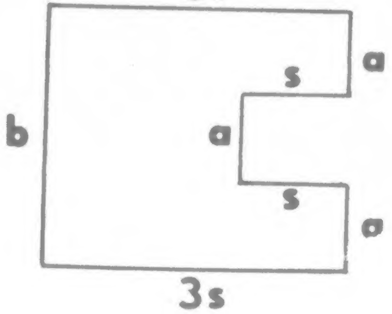
2. S = 12 cm
   A) P = 4 × (s + s); 96 cm
   B) P = (s + s) × (s + s); 144 cm
   C) P = s × s; 144 cm^2
   D) P = 4s; 48 cm



3. S = 4 cm
   a = 3 cm
   b = 9 cm
   A) P = s + a + b; 16 square cm
   B) P = (2 × b) + (8 × s); 50 cm
   C) P = (2 × b) + (8 × s); 50 cm^2
   D) P = b + 2a + 3s; 27 cm

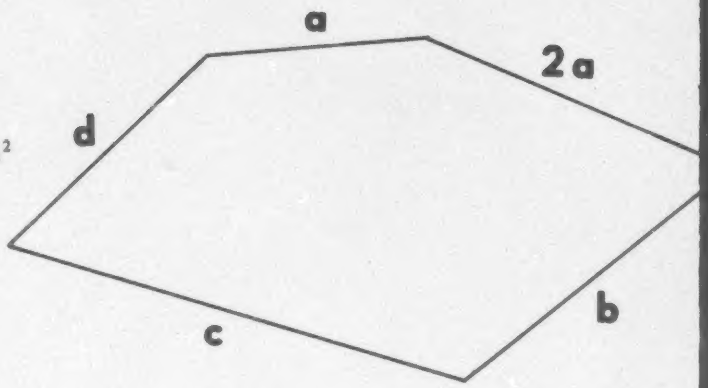


4. S = 4 dm
   a = 3 dm
   b = 9 dm
   A) P = 4s + a + b; 28 dm^2
   B) P = (2 × b) + (8 × s); 50 dm
   C) P = (b × 2) + (4 × s); 28 dm
   D) P = (b + a) + (3s + s); 28 dm^2

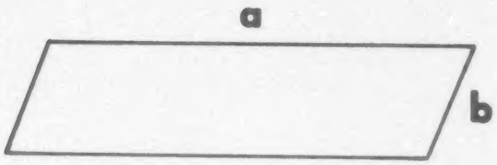


1150 (continued)

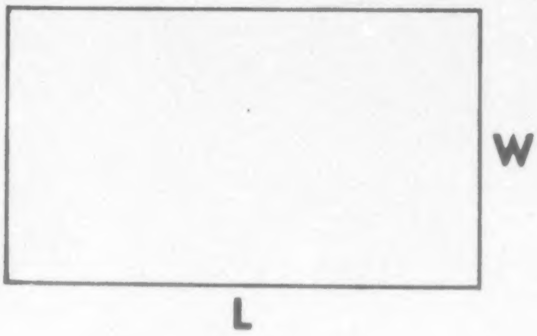
5. a = 3 dm
b = 4 dm
c = 7 dm
d = 5 dm
A) P = (a × b) + (c × d); 47 dm
B) P = 3a + b + c + d; 25 dm^2
C) P = (3a × b) + (c × d); 71 dm^2
D) P = 3a + b + c + d; 25 dm



6. a = 12.5 dm
b = 3.5 dm
A) P = a × b; 43.65 dm^2
B) P = (a × b); 87.30 dm^2
C) P = 2 × (a + b); 32 dm
D) P = 4 × (a + b); 64 dm



7. 1 = 7m
w = 4m
A) P = 2(1 × w); 56 m
B) P = 2 × (1 × w); 56 m^2
C) P = 1 × w; 28 m
D) P = 2(1 + w); 22 m



APPENDIX

IER/CRT MATHEMATICS OBJECTIVE DIFFICULTIES

Objective Number	Target Grade(s)	Median Difficulty	Objective Number	Target Grade(s)	Median Difficulty
0010	1	3.285	0590	4,5	10.090
0020	1	3.620	0600	3,4	10.695
0030	1	3.860	0610	4,5	10.7[illegible]5
0040	1	4.040	0620	3,4	10.815
0050	1	4.380	0630	6,7	10.845
0060	1	4.575	0640	5,6	10.955
0070	1,2	4.575	0650	4,5	11.025
0080	1,2	4.750	0660	5	11.195
0090	1	4.805	0670	5,6	11.270
0100	1,2	5.220	0680	5,6	11.335
0110	2,3	5.260	0690	5,6	11.485
0120	2,3	5.290	0700	5	11.495
0130	2,3	5.370	0710	4,5	11.570
0140	1	5.740	0720	5,6	11.575
0150	1,2	5.835	0730	5,6	11.710
0160	2,3	5.930	0740	7	11.750
0170	1,2	6.005	0750	8	11.840
0180	2,3	6.015	0760	6,7	11.950
0190	1,2	6.265	0770	7	11.970
0200	2,3	6.290	0780	7,8	12.095
0210	2,3	6.310	0790	6	12.110
0220	3,4	6.355	0800	5,6	12.140
0230	2	6.420	0810	7,8	12.155
0240	2,3	6.430	0820	8	12.195
0250	1	6.440	0830	8	12.210
0260	1	6.520	0840	6	12.340
0270	1,2	6.570	0850	7,8	12.410
0280	2	6.895	0860	7	12.475
0290	2,3	6.915	0870	5,6	12.480
0300	2,3	7.245	0880	5,6	12.570
0310	2,3	7.510	0890	6,7	12.605
0320	3	7.535	0900	6,7	12.610
0330	4	7.745	0910	8	12.675
0340	3,4	7.765	0920	5,6	12.840
0350	3,4	7.785	0930	6	12.875
0360	2,3	7.840	0940	6,7	12.905
0370	3,4	7.930	0950	6,7	12.915
0380	3	7.975	0960	6,7	12.975
0390	1,2	8.040	0970	6	13.085
0400	3,4	8.040	0980	6	13.120
0410	4,5	8.135	0990	7,8	13.135
0420	4,5	8.270	1000	8	13.230
0430	2,3	8.285	1010	7,8	13.380
0440	4	8.440	1020	7,8	13.385
0450	3,4	8.540	1030	8	13.490
0460	4,5	8.820	1040	8	13.595
0470	4	8.860	1050	6,7	13.610
0480	3,4	8.920	1060	7,8	13.645
0490	4	8.970	1070	7,8	13.920
0500	4	9.025	1080	8	14.115
0510	4,5	9.390	1090	6,7	14.125
0520	4,5	9.405	1100	8	14.170
0530	3,4	9.625	1110	6,7	14.260
0540	5	9.635	1120	7	14.305
0550	[illegible]	9.670	1130	7	14.320
0560	5,6	9.670	1140	8	14.420
0570	5	9.715	1150	8	14.810
0580	4,5	10.055			

MATHEMATICS ITEM STATISTICS

Item code	Difficulty	Target grade(s)
00101	3.01	1
2	4.17	
3	4.59	
4	10.00	
5	10.00	
00201	3.53	1
2	3.53	
3	3.73	
4	3.84	
5	3.59	
6	4.31	
7	4.74	
00301	2.70	1
2	2.70	
3	3.95	
4	3.86	
5	3.72	
6	10.00	
7	5.50	
00401	3.09	1
2	3.94	
3	4.14	
4	4.54	
00501	2.34	
2	3.97	
3	4.34	
4	4.42	
5	4.59	
6	4.84	
7	4.96	
00601	4.38	1
2	4.45	
3	4.54	
4	4.95	
5	5.68	
6	6.37	
00701	3.85	1,2
2	4.43	
3	4.56	
4	4.90	
5	5.14	
6	5.18	
7	5.21	
00801	4.66	1,2
2	4.72	
3	4.78	
4	4.87	
5	4.87	
6	10.00	
00901	2.06	1
2	4.47	
3	4.47	
4	4.85	
5	4.76	
6	5.18	
7	5.18	
8	5.32	

Item code	Difficulty	Target grade(s)
01001	4.78	1,2
2	4.78	
3	6.08	
01101	4.43	2,3
2	4.70	
3	5.15	
4	5.63	
5	6.10	
6	6.32	
7	6.68	
01201	5.50	2,3
2	5.21	
3	5.49	
4	5.67	
01301	5.04	2,3
2	5.26	
3	5.63	
4	6.80	
01401	4.47	1
2	5.61	
3	5.70	
4	6.61	
5	6.70	
6	8.08	
01501	5.68	1,2
2	5.56	
3	5.81	
4	5.87	
5	5.76	
6	6.09	
7	5.99	
8	6.29	
01601	4.67	2,3
2	5.21	
3	5.21	
4	5.91	
5	6.18	
6	7.16	
7	7.20	
8	7.60	
01701	4.65	1,2
2	5.21	
3	5.98	
4	6.56	
5	6.69	
6	7.33	
01801	5.35	2,3
2	4.87	
3	5.61	
4	6.01	
5	6.02	
6	6.07	
7	6.19	
8	6.39	

MATHEMATICS ITEM STATISTICS

Item code	Difficulty	Target grade(s)
01901	5.09	1,2
2	5.91	
3	6.25	
4	6.26	
5	6.27	
6	6.42	
7	7.32	
8	7.40	
02001	5.84	2,3
2	6.05	
3	6.22	
4	6.48	
5	6.86	
6	7.00	
02101	4.02	2,3
2	5.39	
3	6.08	
4	6.28	
5	6.43	
6	6.49	
7	6.49	
8	7.21	
02201	5.97	3,4
2	6.10	
3	6.31	
4	6.34	
5	6.40	
6	7.34	
7	7.45	
8	7.64	
02301	5.41	2
2	5.71	
3	6.40	
4	7.57	
5	7.76	
6	8.62	
7	8.83	
02401	6.07	2,3
2	6.17	
3	6.28	
4	6.40	
5	6.54	
6	6.83	
7	6.80	
8	7.60	
02501	5.56	1
2	6.32	
3	6.42	
4	6.70	
5	6.74	
6	6.84	
02601	5.30	1
2	5.84	
3	6.47	
4	6.51	
5	6.54	
6	6.58	
7	6.76	
8	6.78	

Item code	Difficulty	Target grade(s)
02701	5.47	1,2
2	5.66	
3	5.96	
4	6.57	
5	6.59	
6	6.58	
7	6.61	
8	6.83	
02801	6.67	2
2	6.68	
3	6.69	
4	6.89	
5	7.17	
6	7.29	
7	7.46	
8	7.64	
02901	6.39	2,3
2	6.52	
3	6.70	
4	6.91	
5	6.94	
6	6.96	
7	7.16	
8	7.17	
03001	7.20	2,3
2	7.24	
3	7.31	
4	7.73	
03101	6.28	2,3
2	7.00	
3	7.09	
4	7.59	
5	7.67	
6	7.91	
7	8.58	
03201	5.92	3
2	6.77	
3	7.00	
4	7.44	
5	8.95	
6	9.14	
03301	7.05	4
2	7.20	
3	7.54	
4	7.73	
5	7.87	
6	7.96	
03401	6.87	3,4
2	7.24	
3	7.66	
4	7.76	
5	8.44	
6	8.81	
7	8.80	
8	9.05	

MATHEMATICS ITEM STATISTICS

Item code	Difficulty	Target grade(s)
03501	6.64	3,4
2	7.36	
3	7.71	
4	7.76	
5	7.97	
6	8.30	
7	8.36	
8	8.48	
03601	7.75	2,3
2	7.84	
3	7.87	
4	8.25	
03701	6.66	3,4
2	7.65	
3	7.92	
4	7.90	
5	8.04	
6	8.06	
7	8.44	
8	8.89	
03801	7.28	3
2	7.44	
3	7.55	
4	7.97	
5	8.02	
6	8.01	
7	8.06	
8	8.28	
03901	7.03	1,2
2	7.27	
3	7.48	
4	8.02	
5	8.13	
6	8.09	
7	9.03	
04001	7.64	3,4
2	7.88	
3	7.95	
4	8.01	
5	8.26	
6	8.32	
04101	7.12	4,5
2	8.13	
3	8.43	
4	8.44	
5	7.47	
6	8.67	
7	9.19	
04201	7.81	4,5
2	7.83	
3	8.19	
4	8.26	
5	8.68	
6	8.99	
7	9.57	
8	10.50	

Item code	Difficulty	Target grade(s)
04301	7.93	2,3
2	8.20	
3	8.27	
4	8.35	
5	8.38	
6	8.46	
7	8.61	
04401	7.96	4
2	8.14	
3	8.28	
4	8.43	
5	8.59	
6	8.61	
7	8.65	
8	8.86	
04501	7.31	3,4
2	7.56	
3	8.35	
4	8.52	
5	8.56	
6	9.00	
7	9.16	
8	9.48	
04601	8.38	4,5
2	8.65	
3	8.67	
4	8.81	
5	9.06	
6	9.62	
7	9.79	
8	9.85	
04701	7.25	4
2	8.19	
3	8.71	
4	8.81	
5	9.08	
6	9.37	
7	9.50	
8	9.82	
04801	7.70	3,4
2	8.52	
3	8.58	
4	8.89	
5	9.33	
6	9.87	
7	10.10	
8	10.17	
04901	8.19	4
2	8.47	
3	8.90	
4	8.96	
5	9.11	
6	9.61	
7	10.04	
8	10.06	

MATHEMATICS ITEM STATISTICS

Item code	Difficulty	Target grade(s)
05001	8.57	4
2	9.86	
3	9.02	
4	9.01	
5	9.23	
6	9.66	
7	9.73	
8	10.12	
05101	9.06	4,5
2	9.36	
3	9.38	
4	9.73	
5	9.86	
6	9.89	
7	9.92	
05201	8.66	4,5
2	8.67	
3	8.87	
4	9.40	
5	9.51	
6	9.62	
7	9.84	
8	9.94	
05301	9.31	3,4
2	9.43	
3	9.53	
4	9.61	
5	9.76	
6	9.79	
7	9.92	
8	10.30	
05401	9.44	5
2	9.53	
3	9.62	
4	9.63	
5	9.77	
6	10.10	
7	10.14	
8	10.42	
05501	9.27	5
2	9.29	
3	9.59	
4	9.66	
5	9.78	
6	9.92	
7	9.94	
8	11.20	
05601	8.24	5,6
2	9.21	
3	10.13	
4	11.87	
05701	9.26	5
2	9.36	
3	9.62	
4	9.69	
5	9.91	
6	10.03	
7	10.36	
8	10.41	
05801	9.13	4,5
2	9.52	
3	9.75	
4	10.02	
5	10.10	
6	10.31	
7	10.38	
8	10.83	
05901	9.46	4,5
2	9.58	
3	9.97	
4	10.09	
5	10.09	
6	10.24	
7	10.29	
8	10.35	
06001	10.45	3,4
2	10.54	
3	11.59	
06101	9.83	4,5
2	10.01	
3	10.20	
4	10.71	
5	12.44	
6	12.44	
7	12.59	
8	13.00	
06201	10.07	3,4
2	10.14	
3	10.45	
4	10.78	
5	11.02	
6	11.10	
7	11.59	
06301	10.03	6,7
2	10.18	
3	10.31	
4	10.78	
5	11.65	
6	12.02	
7	12.55	
8	12.76	
06401	9.43	5,6
2	10.69	
3	10.78	
4	10.94	
5	11.52	
06501	10.84	4,5
2	10.91	
3	10.98	
4	11.02	
5	11.06	
6	11.22	
7	11.30	
8	11.31	

MATHEMATICS ITEM STATISTICS

Item code	Difficulty	Target grade(s)
06601	10.02	5
2	10.34	
3	10.98	
4	11.16	
5	11.40	
6	11.54	
7	12.45	
06701	10.90	5,6
2	11.52	
06801	11.01	5,6
2	11.04	
3	11.28	
4	11.32	
5	11.45	
6	11.72	
7	11.84	
06901	10.68	5,6
2	11.07	
3	11.10	
4	11.47	
5	11.69	
6	11.95	
7	12.59	
8	12.76	
07001	10.34	5
2	10.35	
3	10.50	
4	11.49	
5	11.60	
6	11.62	
7	12.08	
8	12.65	
07101	10.63	4,5
2	10.78	
3	11.55	
4	12.65	
5	13.35	
07201	9.80	5,6
2	10.73	
3	11.05	
4	11.53	
5	11.62	
6	11.86	
7	12.15	
8	12.71	
07301	11.15	5,6
2	11.37	
3	11.53	
4	11.70	
5	11.78	
6	12.42	
7	12.44	
8	12.64	
07401	11.55	7
2	11.55	
3	11.70	
4	11.74	
5	11.80	
6	11.82	
7	12.07	
8	12.11	
07501	10.43	8
2	11.06	
3	11.51	
4	11.76	
5	12.10	
6	12.26	
7	12.50	
07601	11.40	6,7
2	11.63	
3	11.73	
4	11.90	
5	13.02	
6	13.24	
7	13.35	
8	14.37	
07701	11.37	7
2	11.48	
3	11.84	
4	11.93	
5	12.04	
6	12.25	
7	12.48	
8	12.56	
07801	11.71	7,8
2	11.76	
3	11.86	
4	12.07	
5	12.15	
6	12.55	
7	12.64	
07901	10.90	6
2	12.35	
3	13.41	
4	11.72	
5	11.82	
6	12.09	
7	12.31	
8	12.50	
08001	11.77	5,6
2	11.85	
3	11.96	
4	12.12	
5	12.16	
6	12.31	
7	12.49	
8	12.56	

MATHEMATICS ITEM STATISTICS

Item code	Difficulty	Target grade(s)
08101	10.60	7,8
2	10.78	
3	11.87	
4	12.07	
5	12.30	
6	12.54	
7	12.71	
8	13.02	
08201	11.90	8
2	11.95	
3	12.03	
4	12.17	
5	12.34	
6	13.01	
7	13.18	
08301	10.61	8
2	11.20	
3	11.99	
4	12.15	
5	12.27	
6	12.80	
7	14.22	
8	14.40	
08401	11.75	6
2	12.03	
3	12.32	
4	12.79	
5	12.83	
6	12.83	
7	12.94	
08501	11.29	7,8
2	11.70	
3	11.80	
4	12.37	
5	12.76	
6	13.05	
7	13.13	
8	13.21	
08601	11.58	7
2	11.70	
3	12.25	
4	12.43	
5	12.52	
6	12.80	
7	12.95	
8	14.01	
08701	11.36	5,6
2	12.02	
3	12.49	
4	12.76	
5	13.37	
08801	11.02	5,6
2	11.78	
3	12.45	
4	12.55	
5	12.59	
6	12.67	
7	12.78	

Item code	Difficulty	Target grade(s)
08901	11.35	6,7
2	11.54	
3	11.64	
4	12.60	
5	12.73	
6	12.74	
7	13.34	
09001	11.62	6,7
2	11.96	
3	12.04	
4	12.61	
5	12.70	
6	13.11	
7	13.29	
09101	11.38	8
2	11.41	
3	11.84	
4	12.66	
5	13.13	
6	13.18	
7	13.34	
8	13.68	
09201	12.18	5,6
2	12.50	
3	12.81	
4	12.90	
5	13.27	
6	13.44	
7	13.52	
09301	12.52	6
2	12.77	
3	12.78	
4	12.87	
5	13.24	
6	13.38	
7	13.45	
8	13.58	
09401	11.15	6,7
2	12.70	
3	12.90	
4	12.90	
5	13.04	
6	13.05	
7	13.24	
09501	12.74	6,7
2	12.78	
3	12.91	
4	13.12	
5	13.13	
6	13.27	
7	14.37	
09601	12.58	6,7
2	12.96	
3	13.19	
4	13.35	

MATHEMATICS ITEM STATISTICS

Item code	Difficulty	Target grade(s)
09701	11.90	6
2	12.97	
3	13.08	
4	13.15	
5	13.16	
6	13.16	
7	13.45	
09801	12.25	6
2	12.96	
3	13.07	
4	13.17	
5	13.28	
6	13.49	
7	13.80	
09901	12.17	7,8
2	12.83	
3	13.04	
4	13.13	
5	13.14	
6	13.16	
7	13.23	
8	13.28	
10001	11.94	8
2	11.96	
3	12.76	
4	13.22	
5	13.62	
6	13.85	
7	14.12	
10101	12.60	7,8
2	13.08	
3	13.10	
4	13.58	
5	13.82	
6	14.23	
7	14.43	
10201	12.33	7,8
2	12.57	
3	13.34	
4	13.86	
10301	12.60	8
2	13.04	
3	13.46	
4	13.48	
5	14.26	
6	14.43	
7	14.49	
10401	12.49	8
2	13.23	
3	13.28	
4	13.98	
5	14.04	
6	14.58	

Item code	Difficulty	Target grade(s)
10501	13.24	6,7
2	13.26	
3	13.35	
4	13.60	
5	13.76	
6	13.80	
7	14.00	
8	14.59	
10601	13.16	7,8
2	13.51	
3	13.63	
4	13.64	
5	13.79	
6	13.88	
7	14.15	
8	14.19	
10701	13.80	7,8
2	13.83	
3	13.85	
4	13.92	
5	13.96	
6	13.99	
7	14.44	
10801	12.97	8
2	13.21	
3	14.05	
4	14.18	
5	14.30	
10901	12.51	6,7
2	13.04	
3	14.11	
4	14.20	
5	14.45	
6	14.88	
11001	13.59	8
2	13.72	
3	14.02	
4	14.16	
5	14.38	
6	14.40	
7	14.44	
8	14.57	
11101	13.69	6,7
2	13.98	
3	14.06	
4	14.26	
5	14.51	
6	14.60	
7	14.61	
11201	12.91	7
2	12.98	
3	14.00	
4	14.28	
5	14.37	
6	15.05	
7	15.10	
8	15.15	

MATHEMATICS ITEM STATISTICS

Item code	Difficulty	Target grade(s)
11301	13.82	7
2	13.99	
3	14.07	
4	14.28	
5	14.55	
6	14.55	
7	14.64	
8	14.84	
11401	12.74	8
2	14.13	
3	14.82	
4	14.92	
11501	13.90	7,8
2	14.03	
3	14.56	
4	14.81	
5	14.88	
6	15.06	
7	15.34	

ANSWER KEY

MATHEMATICS ITEMS ANSWER KEY

Item Code	Key
00101	C
2	A
3	B
4	D
5	C
00201	D
2	D
3	B
4	C
5	A
6	B
7	D
00301	B
2	C
3	D
4	C
5	D
6	B
7	A
00401	B
2	C
3	D
4	B
00501	A
2	D
3	B
4	B
5	C
6	B
7	B
00601	B
2	B
3	C
4	C
5	D
6	D
00701	B
2	C
3	C
4	D
5	D
6	B
7	B
00801	C
2	D
3	C
4	B
5	D
6	A
00901	A
2	C
3	D
4	C
5	B
6	C
7	D
8	B
01001	A
2	D
3	C
01101	B
2	D
3	C
4	B
5	A
6	D
7	D
01201	A
2	D
3	B
4	C
01301	D
2	D
3	C
4	B
01401	A
2	C
3	D
4	C
5	D
6	B
01501	A
2	A
3	B
4	D
5	B
6	C
7	A
8	C
01601	D
2	D
3	A
4	C
5	C
6	B
7	B
8	D
01701	B
2	D
3	B
4	C
5	A
6	C
01801	A
2	B
3	C
4	B
5	D
6	C
7	A
8	D
01901	A
2	B
3	A
4	C
5	A
6	C
7	D
8	C
02001	B
2	B
3	B
4	A
5	A
6	A
02101	C
2	D
3	B
4	B
5	A
6	B
7	D
8	A
02201	A
2	A
3	B
4	B
5	C
6	D
7	C
8	D
02301	D
2	D
3	B
4	B
5	B
6	A
7	A
02401	A
2	B
3	D
4	C
5	B
6	B
7	C
8	D
02501	B
2	C
3	D
4	B
5	C
6	D
02601	C
2	B
3	D
4	D
5	A
6	B
7	C
8	A
02701	D
2	A
3	A
4	C
5	C
6	A
7	C
8	D
02801	A
2	A
3	B
4	A
5	A
6	B
7	B
8	B
02901	A
2	D
3	C
4	D
5	B
6	B
7	C
8	B
03001	A
2	B
3	B
4	A
03101	B
2	B
3	B
4	C
5	D
6	C
7	A
03201	A
2	C
3	C
4	A
5	D
6	D
03301	B
2	A
3	C
4	A
5	B
6	B
03401	A
2	B
3	D
4	A
5	C
6	D
7	B
8	B
03501	C
2	B
3	D
4	C
5	B
6	B
7	C
8	A
03601	C
2	D
3	A
4	C
03701	B
2	A
3	D
4	B
5	A
6	D
7	D
8	B
03801	A
2	A
3	A
4	D
5	D
6	B
7	D
8	C
03901	B
2	B
3	B
4	B
5	A
6	A
7	B
04001	A
2	D
3	C
4	D
5	C
6	B
04101	B
2	B
3	D
4	C
5	D
6	A
7	D
04201	A
2	C
3	B
4	A
5	A
6	B
7	C
8	B
04301	B
2	C
3	A
4	D
5	C
6	A
7	B
04401	D
2	A
3	B
4	C
5	C
6	A
7	D
8	C
04501	D
2	B
3	D
4	D
5	C
6	C
7	B
8	D
04601	A
2	C
3	D
4	D
5	C
6	A
7	B
8	A
04701	B
2	A
3	B
4	C
5	B
6	C
7	C
8	A
04801	C
2	C
3	A
4	A
5	D
6	D
7	A
8	B
04901	B
2	A
3	B
4	C
5	A
6	C
7	C
8	C

Mathematics Items Answer Key

Item Code	Key
05001	D
2	A
3	D
4	C
5	B
6	D
7	B
8	A
05101	C
2	A
3	B
4	D
5	B
6	C
7	C
05201	A
2	C
3	B
4	D
5	B
6	C
7	D
8	A
05301	D
2	C
3	D
4	A
5	C
6	D
7	B
8	D
05401	C
2	A
3	C
4	A
5	D
6	D
7	B
8	B
05501	A
2	B
3	C
4	B
5	C
6	A
7	C
8	B
05601	A
2	C
3	C
4	D
05701	B
2	C
3	A
4	A
5	B
6	A
7	B
8	B
05801	A
2	D
3	C
4	D
5	D
6	A
7	C
8	A
05901	B
2	C
3	A
4	B
5	A
6	C
7	D
8	D
06001	A
2	C
3	A
06101	A
2	B
3	A
4	C
5	B
6	C
7	C
8	B
06201	B
2	C
3	B
4	B
5	C
6	C
7	B
06301	A
2	D
3	B
4	C
5	D
6	C
7	D
8	A
06401	B
2	A
3	A
4	B
5	B
06501	C
2	A
3	B
4	B
5	B
6	C
7	C
8	A
06601	A
2	C
3	C
4	D
5	D
6	A
7	B
06701	D
2	C
06801	B
2	C
3	D
4	A
5	C
6	A
7	B
06901	B
2	A
3	A
4	B
5	B
6	D
7	A
8	D
07001	C
2	B
3	D
4	B
5	C
6	A
7	D
8	D
07101	D
2	D
3	E
4	E
5	D
07201	C
2	C
3	A
4	B
5	C
6	D
7	D
8	B
07301	D
2	D
3	B
4	B
5	B
6	B
7	B
8	C
07401	B
2	B
3	A
4	D
5	A
6	D
7	C
8	C
07501	C
2	C
3	B
4	B
5	A
6	C
7	C
07601	B
2	A
3	C
4	D
5	B
6	B
7	A
8	D
07701	D
2	B
3	D
4	A
5	B
6	A
7	B
8	A
07801	B
2	B
3	D
4	D
5	C
6	A
7	C
07901	A
2	B
3	C
4	A
5	B
6	B
7	A
8	C
08001	C
2	B
3	D
4	A
5	C
6	C
7	B
8	D
08101	D
2	A
3	D
4	D
5	C
6	D
7	A
8	D
08201	A
2	A
3	C
4	B
5	B
08301	C
2	A
3	A
4	D
5	D
6	C
7	A
8	C
08401	D
2	A
3	B
4	D
5	C
6	B
7	A
08501	B
2	B
3	D
4	D
5	D
6	B
7	A
8	D
08601	B
2	D
3	A
4	B
5	C
6	A
7	B
8	D
08701	A
2	C
3	A
4	B
5	B
08801	B
2	D
3	C
4	A
5	D
6	D
7	D
08901	A
2	A
3	A
4	B
5	A
6	B
7	C
09001	D
2	A
3	A
4	A
5	B
6	A
7	A
09101	A
2	C
3	C
4	B
5	A
6	A
7	B
8	C
09201	A
2	A
3	B
4	A
5	B
6	B
7	C
09301	C
2	B
3	D
4	A
5	D
6	A
09401	D
2	C
3	B
4	B
5	A
6	D
7	B
09501	A
2	C
3	C
4	B
5	D
6	C
7	D
09601	C
2	A
3	A
4	C

Mathematics Items Answer Key

Item Code	Key	Item Code	Key	Item Code	Key
09701	D	10501	A	11301	B
2	A	2	A	2	B
3	B	3	B	3	A
4	A	4	D	4	D
5	A	5	B	5	C
6	A	6	D	6	D
		7	A	7	B
09801	B	8	C	8	A
2	C				
3	A	10601	A	11401	C
4	B	2	A	2	B
5	D	3	C	3	B
6	C	4	B	4	A
7	D	5	A		
		6	C	11501	C
09901	C	7	D	2	D
2	C	8	D	3	B
3	B			4	B
4	C	10701	D	5	D
5	C	2	D	6	C
6	B	3	C	7	D
7	D	4	C		
8	A	5	A		
		6	A		
10001	B	7	D		
2	B				
3	B	10801	B		
4	A	2	A		
5	D	3	C		
6	D	4	A		
7	C	5	C		
10101	B	10901	D		
2	B	2	C		
3	A	3	D		
4	A	4	A		
5	A	5	C		
6	B	6	A		
7	B				
		11001	A		
10201	B	2	B		
2	D	3	B		
3	D	4	C		
4	A	5	C		
		6	A		
10301	A	7	B		
2	B	8	A		
3	B				
4	D	11101	D		
5	D	2	A		
6	C	3	B		
7	A	4	B		
		5	A		
10401	D	6	C		
2	C	7	D		
3	B				
4	B	11201	A		
5	A	2	A		
6	C	3	D		
		4	D		
		5	B		
		6	D		
		7	A		
		8	C		